

FROM THE EDITORS - Margaret McMillan and Jane Conway

ADVANCING NURSING PRACTICE

The papers in this *AJAN* exemplify how nurses participate in, lead, and respond to situations of uncertainty. Recurring themes in the literature related to advancing nursing practice are the need to demonstrate commitment, confidence, resourcefulness and resilience in order to influence and react positively to change. Each of the papers highlights one or other of these attributes.

It is often argued that as professionals, nurses need to continue to be able to examine practice in order to develop strategies to address the gap between 'knowing about' and 'doing'. Education is frequently proffered as the solution to deficits in practice. However, the paper by Jastrzab, Fairbrother, Kerr and McInerney, in which they explore nurses' knowledge, attitudes and beliefs about pain, suggests that despite considerable effort to promote change in practice through education, transfer of knowledge into practice is influenced by a range of factors including a sense of confidence in one's practice and a willingness to change. Greater levels of confidence result from addressing challenges and achieving success when implementing options in approaches to care. In addition to this, confidence is enhanced when systems and processes are supportive of development of practice and practitioners. Sinclair, Boyd and Sinnott describe an alternative approach to assessment and discharge planning through enhancing the nurse's roles and functions and embedding this in a supportive organisational structure. This, they argue, leads to streamlining care and efficient and effective use of resources.

In a similar vein, O'Keefe and Gardner's discussion of the development of the sexual health nurse practitioner role indicates the extent to which nurses can enhance service delivery, engage with diverse clientele, promote client knowledge of and compliance with preventative strategies, and contribute to the development and implementation of standardised protocols.

Further evidence of the nurses' ability to manage resources effectively, both fiscal and human, is presented in the paper by Barrett, Stevens and Taranter whose research provides useful insight into how nurses' questioning of procedures and existing protocols can result in significant cost savings. In principle, it would be reassuring if the cost savings achieved were realigned to other core nursing activities - as nurses often achieve

cost savings but do not reap the benefits. It would seem that while nurses may have knowledge of strategies that would enhance practice they often struggle to remain resilient in the face of resistance.

Davis, Edwards, Mohay and Wollin's paper, which explores the course of depression in mothers of premature infants, suggests that nurses have an important role to play in facilitating the development of courage and resilience among woman who experience increased stress and depression.

Nurses themselves need to develop the capacity to enhance their own resilience. In the paper titled 'The Deakin Coping Scale', Moore provides insight into how nurses cope effectively with stressful situations and identifies strategies that enhance or inhibit coping. Resilience is reflected in the efforts of nurses to enhance the quality of care they deliver. A particular level of commitment is needed to manage symptoms and situations, because the dynamic nature of contexts of practice often results in fragmentation of patient experiences.

At another level, the dynamic nature of the political and social contexts of nursing has the potential to result in fragmentation of the profession. Ella Lowe's guest editorial provides an overview of the conduct of the Australian National Review of Nursing Education (Commonwealth of Australia 2002). Lowe focuses on nurse education and emphasises the incongruence between funding models and the cost of supervision of undergraduate students. In addition, her editorial alludes to the reform agenda and the frustrations and challenges of awaiting outcomes of decision making external to nursing.

It seems tenacity, patience and commitment will be required of the profession as we await the generation of policy that will make a meaningful contribution to advancing nursing practice.

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INTRODUCTION

One could argue that workforce planning is 'black art'. This is well demonstrated in the ongoing debate concerning the national shortage of nurses in Australia. Our shortage is similar to that experienced in many other countries. But citing this does little to assuage local concerns. One issue is clear however: nursing is now part of a wider globalization of workforce markets where skilled nurses are seen as commodities that can be traded between various countries and states.

So what are some of the issues that have led to this situation? Within Australia, debate between funders (largely state and federal governments) and within the health industry and profession over costs and responsibilities to educate nurses remains a major issue. This has become more strident particularly in the context of the current shortage. One cannot escape issues around the high cost of undergraduate education and the extra demands this has placed on an already stressed industry and education sector.

The last decade has seen nursing workforce planning largely relegated to the dynamics of labour force economics, with governments allowing market forces to adjust the demand for and supply of nurses. By any reasonable reckoning, this has been a singular failure in public policy. This may be best illustrated by a projected disparity between demand and supply of registered nurses by 2010 of the order of 40,000 (Karmel and Li 2002). To place this level of shortage in context, there are currently about 55,000 registered nurses (Division 1) in Victoria (Nurses Board of Victoria 2003), so the magnitude of this projected shortage is enormous by any reasonable measure. From a policy perspective, if the view of governments at state and federal levels was that the market would maintain some kind of equilibrium between supply and demand, then the current situation within nursing today is living testimony that that was a very shortsighted view.

The Report of the National Review of Nursing Education *Our duty of care* (2002) was presented to government more than one year ago. Both state and federal governments agreed to the wide-ranging terms of reference. The approach adopted in the report drew heavily on feedback from stakeholders and acknowledged a number of major policy issues including:

- Health care is a national issue and that health care provision must be effective and efficient;

- Future developments in nursing should build on current expertise and promote continuous improvement, planning and quality; and,
- Nursing is professionally cohesive with growing support for a national approach to both standards and professional regulation.

As well as this national approach, almost all states and territories have undertaken some kind of comprehensive review of their nursing workforces in the last few years. These have ranged in scale and depth but have generally addressed workforce issues, particularly those relating to recruitment and retention. This is a positive step forward. Whilst a clearer and cogent approach to workforce policy at a federal level will assist in developing national workforce policy, individual states and territories have also been able to identify issues specific to their location, geography, and demography which will require specific policy attention at a state and local level. Given the size, population density and diversity Australia enjoys, this will assist in ensuring that policy can adapt to local conditions.

What has happened within this milieu of reports to state and federal governments about the status of the nursing workforce? Generally, both industry and education sectors appear to have been positive in their initial responses. State governments have implemented recommendations from local reports, and certainly recruitment and retention issues have impacted on policy (including employment terms and conditions) at that level.

At a federal level, the report *Our universities: Backing Australia's future* (Commonwealth of Australia 2003) does address, in some measure, some of the supply concerns raised by these reports. But many of the recommendations will rely on a safe passage through parliament, which is fraught with uncertainty. And these initiatives will not address in any measure the projected shortfall in nurses cited earlier.

Debate about the nursing shortages and recommendations from the various reports has been muted. While the release of reports has led to a flurry of press releases, they have not led to any sustained debate that has gained either wider press coverage or indeed political action. Using the National Review of Nursing Education as an example, this does not mean to say that the federal government is not actively addressing

or acting on the recommendations. This activity is not visible to the broader profession of nursing. What is clear, however, is that there has been no comprehensive and cohesive response from government to the review's recommendations.

This is in stark contrast to the hands-on and highly visible approach that the newly appointed Federal Minister for Health and Ageing, Tony Abbott has employed in dealing with the medical indemnity crisis.

Given this bleak outlook for the supply of nurses into the foreseeable future, how can the health care needs of Australia be addressed? Firstly, it will be imperative to ensure that this scarce resource is wisely used. Secondly and most importantly, we will need to better organise and support change within the various contexts of care where nurses work. This is an area of workforce planning that demands much more interest and research than has been undertaken so far. We will need to understand how nurses plan and organise the work they do, and also examine the effectiveness of the kinds of models of work organisation that are used. In effect, we need to work out how to maximise the utilisation of a scarce set of skills.

And what of the future? State and federal governments need to ensure that appropriate planning and policy development work cohesively to ensure a planned recovery from the current supply crisis into the future. There needs to be much more open debate about the current shortage. Governments must continue to consult with the industry in the development of policy. Adequate funding will be vital to ensure that there is positive material change in the current serious situation confronting nursing both within educational and industry settings.

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A SHELF-LIFE TRIAL: EXAMINING THE EFFICACY OF EVENT RELATED STERILITY PRINCIPLES AND ITS IMPLICATIONS FOR NURSING PRACTICE

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ABSTRACT

This study set out to test the hypotheses that: 1) stock sterilised in a central sterilizing supply department using the guidelines from the Australian Standards (AS4187) will not become contaminated over two years unless it is exposed to an event; and, 2) a variety of packaging types can be used successfully in maintaining a sterile barrier over the two year trial period. A random controlled, time series, repeated measures design was used to test the hypotheses. Four hundred items were sterilised, wrapped in three different pack types, stored and regularly handled by nurses over a two-year period. Forty items were randomly selected for sterility testing each three months over the two years. The results showed that there was no contamination of stock over two years related either to time or the pack type used. Given that many nurses work in and manage CSSDs and many nurses use sterile stock in their work there are significant implications for nursing practice emanating from the findings. It was also calculated that the costs of meeting the Australian Standard AS4187 were reduced over the two year trial by up to 2400% by using event related sterility principles and an evidence based approach to the choice of packaging materials used in management of sterile stock.

INTRODUCTION

The stand alone central sterilising supply departments (CSSDs) of most hospitals in Australia have evolved historically from nurses' work in operating theatres to include maintaining and improving the management of sterile stock (Taylor 1993). The gradual introduction of new standards and evidence based principles for the management of sterile stock since the early 1990s has major implications for nurses who work in CSSDs and those who use sterile stock in their practice.

Current research supports the theory that contamination of sterilised stock is event related (Polzella and Holbeche 2002; Belkin 1996; Morall 1995; Taylor 1993; Butt et al 1991; Donovan et al 1991) and not, as it has been historically related, to time (Taylor 1993). The principle of event related sterility (ERS) is now considered as the Australian Standard (AS4187:55) for CSSDs. The standards suggest that contamination is related to features of the CSSD environment and/or the sterile storage area, wrapping materials, storage, handling and opening behaviours rather than just over time alone as has been the established principle.

A review of published material by Taylor (1993) indicated there was little evidence to show the veracity of time related sterilisation (TRS) principles yet as Taylor (1993) notes hospitals have historically expended considerable resources in complying with this principle. According to Polzella and Holbeche (2002) and Taylor (1993) most Australian hospitals have applied a policy of 30-day stock rotation. That means every item is considered contaminated every 30 days even if sterility barriers are still intact. The calculation of costs associated with sterilisation must consider: stock management; stock depreciation resulting from wear and tear through the regular sterilisation process; labour;

materials; and, damage to the environment from unnecessary use of cleaning products and wrapping materials. Every time an item is sterilised these costs are incurred. Though the time related sterility management process has appeared to be effective in controlling patient infections it is likely to have been a significant contribution to the high cost of managing CSSDs.

The two main potential benefits of ERS management strategies to the CSSD therefore are: 1) direct costs savings from reduced material, labour, stock depreciation arising from sterilisation; and, 2) the quality improvement and evidence based process that is implicit in the event related sterility principles.

Continuous improvement is more systematically applied to the processes of sterilisation, storage, handling, transport and opening of stock using ERS principles.

It would appear that ERS provides a principle for nurses and CSSD technicians to use in developing a more flexible evidence based approach to issues like choice of sterilising processes, packaging and shelf-life use by dates. To date, however, there are too few studies reported in the literature to provide the evidence required for CSSDs to be confidently informed to make decisions about changing practice. For the moment at least CSSDs have to validate their own practices by undertaking their own studies into their adoption of ERS principles. Only one clinical study (Polzella and Holbeche 2002) has been found that rigorously examines ERS and the more flexible use of packaging to maintain the AS4187 standards.

Polzella and Holbeche (2002) found there was no greater contamination when stock sterilized under AS4187 guidelines was stored for six months compared to stock that was reprocessed every 30 days. The authors also undertook a time and motion study examining the time taken to wrap sterile safety pins in three different pack types. The results showed a 90% difference in the time taken to wrap sterile safety pins in the most complicated packaging used in their study, double linen and double paper, compared to their simplest packaging, single paper and single linen. The findings also showed no contamination over the six-month trial indicating there was no difference between pack types for rates of contamination.

This study aimed to test over a two-year period the efficacy and material costs associated with shelf-life sterility and different combinations of packaging using the principles of event related sterility. The hypotheses for this study are that: 1) stock sterilised in CSSD using the guidelines from the Australian Standards (AS4187) will not become contaminated over two years unless they are exposed to an event; and, 2) costs can be reduced in the CSSD by using event related sterility principles compared to processes using the principle of time related sterility and a 30-day shelf life expiry date system of stock management.

METHOD

This study used a quasi-experimental, time series, repeated measures design. At the start of this trial no literature was available to benchmark the procedures or to assist in determining sample size. Anecdotal evidence from CSSD networks, however, suggested that 20 items was the minimum number of measurements required if auditing the reliability of the sterilization machines and other processes.

Our design allowed for 40 items to be selected randomly from a pool of 400 and be tested for contamination every three months for two years. In addition, 80 items of the overall sample would be randomly selected for testing immediately after sterilizing and packing; known as time zero. It was determined therefore that 400 would make up the sample required.

The test item chosen for sterilization was the 50mm steel paper clip wrapped in one of three different types of packaging: 1) Double linen and double paper; 2) Single linen and single paper; and 3) Laminate.

The paper clip is similar in mass and shape to screws, plates and other small items that are commonly processed in CSSDs. In addition, the paper clip was chosen as this was unfunded research. The relatively small cost of paper clips and packaging materials to wrap them would keep the resources required for the study to a minimum. We also found in a pilot test of the trial that larger items greatly increased the resources required by the microbiology laboratory in the processes of sterility testing.

Preparing the sample

In order for the study to have practical relevance, the processes by which the packs were prepared, stored, handled and transported mimicked as closely as possible the normal day-to-day processes of the department. All CSSD staff were included in the sterilising, wrapping and storing of the 400 paper clips as they would be under normal daily conditions of work on any stock item. Each pack carried a chemical indicator and was wrapped according to the AS4187 protocols for linen, paper and laminate wrapping.

1) Double linen double paper (n=100): The wraps were double linen inner pre laundered by the local linen service and a double outer Steri-sheet. These packs were wrapped using a horizontal inner wrap and an envelope outer wrap. Autoclave tape was used to secure the packs.

2) Single linen and single paper (n=200): The wraps were a single linen inner and a single outer Steri-sheet. The packs were wrapped using a horizontal inner wrap and an envelope outer wrap. Autoclave tape was used to secure the packs.

3) Laminate (n=100): These packs were prepared using rolls of laminate and securing a seal with a Zen-seal heat sealer.

Thermocouple tests were run and biological indicators were incubated on site as per standard protocol for tests of reliability.

Following the wrapping of all the items each item was numbered and then sterilized. Eighty packs were chosen by random number generation - numbered tickets were drawn from a sealed container by a blindfolded staff member and thus the equivalent numbered item was selected - and sent to the microbiology laboratory for sterility testing. The remainder were placed in a variety of locations on the department's shelves.

Sterile packs in this facility are stored in the CSSD in a designated sterile storage area which complies with the requirements of AS4187:55. Some sterile items are also stored in designated specialty trolleys. The packs for the research were randomly selected and stored among the sterile stock and also on the specialty trolleys by CSSD staff. Theatre staff regularly take extra items into the set-up rooms ('just in case') and if not used, these items are returned to CSSD. The theatre staff were blind to the purpose of the research items and routinely handled the items to move them around the stock trolleys and returned them unused to the sterile stock shelves. Each research item had an equal chance of being placed on the shelves or speciality trolleys by CSSD staff and treated in the manner described above by theatre staff.

Sterility testing of packs

Every three months 40 packs were selected by lottery method for sterilization testing at the microbiology laboratory. Each pack was identified by a code which was unknown to pathology staff. All packs were processed within 24 hours of arriving at the laboratory. All packs were processed inside a 'Class 2 Email safety cabinet' to reduce the risk of external contamination.

Thioglycollate broth was used as the growth medium as it supports the growth of the expected organism such as bacillus, staphylococcus, corynebacteria and streptococcus species.

Paper clips were removed from the packs using sterile forceps and placed into a sterile thioglycollate broth tube. The tubes were incubated for seven days at room temperature and seven days at 35°C (+/-2°C). The tubes were examined each day for turbidity. All broths were subcultured onto blood/MacConkey agar plates at the end of the 14-day incubation or when broth became turbid under aerobic conditions at 35°C. If broths were found to be turbid and no growth occurred on the initial subculture the broths were then subcultured onto full blood agar plates and incubated anaerobically at 35°C (+/-2°C).

RESULTS

Contamination

The initial random selection of 80 packs for testing at time zero showed that the paper clips were sterile and that the biomarkers and onsite incubation tests were reliable.

In a measure of 80 items at time zero and a further eight repeated measures of 40 items per measure over two years, no contamination occurred on any of the 400 items that was related to the sterilisation process, wrapping, storage, pack handling or transport over the two year period.

The pathology laboratory sterility tests were vicariously validated by the detection of five cultures growing organisms. On examination it was revealed that the contamination was directly related to failures in the seals of the broth tubes at the incubation phase of the laboratory tests. No contamination was found that directly related to the sterilization process or failure of the sterile barriers. Therefore, there was no difference between groups for contamination related to time or the type of packaging used.

Cost of materials

Table 1 shows the cost comparison of the actual cost of materials used in sterilising and wrapping the 400 paper clips under management practices guided by ERS compared to hypothetical costs using TRS and 30 day stock rotations over two years. The materials cost are based on prices as of July 2002.

The costs of materials as shown in table 1 is calculated by the formula $P \times N \times R = C$.

where: P=the cost of packaging used in the sterilization process for example linen, paper, laminate, cleaning solutions and bio tests; N=the number of similar items; R=the number of shelf life rotations and re-sterilisation; and C=the cost of materials.

Table 1 shows that material costs would have been 24 times greater for TRS management than the actual cost of materials used under ERS management principles. It also shows the difference in costs between the different pack types. Laminate was the cheapest at 57.8% less than the cost of the most expensive wrapping, double linen and double paper and 45.8% cheaper than single linen and single paper wraps. The single linen and single paper wraps were 22.3% cheaper than double linen and double paper.

DISCUSSION

These findings would appear to provide CSSD managers and nurses utilising sterile stock in their practice with an evidence base to support the introduction of event related sterility (ERS) principles. Despite the simulation of 'normal' handling and storage by nurses

Table 1: Cost comparison of sterile barrier materials using event related sterility principles versus time related sterility principles for 400 items and three different packing types over two years.

Wrap type	Event related sterility materials cost calculation				Time related sterility materials cost calculation									
	P	x	N	x	R	=	C	P	x	N	x	R	=	C
Double linen + double paper	0.90		100		1		\$ 90	0.90		100		24		\$2,160
Single linen + single paper	0.70		200		1		\$140	0.70		200		24		\$3,360
Laminate	0.38		100		1		\$ 38	0.38		100		24		\$ 912

$P \times N \times R = C$ $P = \text{price of packaging}$ $N = \text{number of items}$ $R = \text{number of sterilisations}$ $C = \text{total cost of packaging materials over two years}$

over the two year trial, no contamination occurred to any of the 400 sterilised items.

These findings, like those of Polzella and Holbeche (2002), also show that there was no difference in the contamination rate between packing types. All packs containing sterile stock items were provided an equal random opportunity of a contamination event occurring as the trial procedure included a program of regular handling and transportation to and from CSSD stores by nurses and CSSD technicians.

Table 1 shows a 2,400% difference in cost of sterile barrier materials between event related sterility management strategies and time related sterility strategies. This calculation does not consider the additional costs associated with the process such as labour, stock depreciation through wear and tear related to the sterilisation process or other work process factors. It is likely the difference in the cost of these factors would also differ by a factor of 24 over two years as well.

Table 1 also shows the difference in cost of materials between each pack type. The material cost alone differed by 57.8% between the most expensive and the cheapest wrap. If the results of the time and motion study undertaken by Polzella and Holbeche (2002) can be extrapolated between CSSDs then labour costs associated with using these packaging types for small items could vary by up to 90%.

The evidence that there was no difference in contamination rates over time or related to pack types, for paper clips at least, suggests there are financial, human and environmental resource efficiencies to be gained by CSSD nurses and technicians in using an evidence based approach to the choice of wrapping.

This flexibility in practice does not appear to compromise standard AS4178. The evidence from these data does not support the traditionally held CSSD practice as discussed by Taylor (1993) which assumed that more packaging/wraps provides more protection from contamination, in the case of small items like paper clips at least. Whether this theory is sustained with more complicated and heavier items such as full instrument trays is yet to be tested.

While we have attempted to emulate the normal CSSD treatment of the test items in this study, in reality it is unlikely that 400 stock items would ever remain unused in a well managed department over two years. The example serves to show, however, that implementing ERS management strategies has the potential to generate large savings of resources without creating any greater risk of infection to the patients or staff than did TRS practices.

This research project has had a number of direct effects on CSSD and nursing practices. As a result of this study:

- Event related sterility has been established as the strategy of choice for most stock items;
- There has been a measurable reduction in backdating which affects consumable costs, staff hours and wear and tear on the equipment;
- The adoption of an evidence based approach by the nurse manager to the choice of packaging materials has reduced the costs of materials and labour;
- Processes have been developed to educate and maintain the skills of nursing staff in the storage and handling of the sterile packs in theatres and on the wards;
- The CSSD has developed an effective, valid and reliable method of investigation that has now become a significant part of the continuous quality improvement program. The department is now repeating the above study for large items such as full instrument trays.

CONCLUSION

This study set out to test the hypotheses that: 1) using the guidelines from the Australian Standards (AS4187) stock sterilised in CSSD will not become contaminated over two years unless exposed to an event; and, 2) costs are reduced in the CSSD by implementing event related sterility principles compared to time related sterility and a shelf life expiry date every 30 days.

The results showed that there was no contamination of stock related to time over two years and that considerable resource savings are associated with management that

uses event related sterility strategies. The cost of packaging materials alone was calculated to be 24 times cheaper for event related sterility management strategies than time related sterility with a 30 day stock rotation management strategy.

The results also showed that packaging materials in the sterilisation process could be chosen on an evidence based approach; that is, the packaging suitability can be determined by outcomes related to its ability to maintain an effective barrier as prescribed in the standard AS4187.

The findings of this study showed that there was no difference between the three packaging types under trial for contamination rates after two years despite regular handling and storing by nurses. The cost of the packaging, however, varied by 57.8% between the most expensive wraps; (double linen double paper), and the least expensive wrap (laminated). These findings have implications for hospital budgets and also provide evidence to support the use of ERS principles in the practice of nurses working in and managing CSSDs and those using and managing sterile stock in

their work. What remains to be done is a series of replication studies examining the sterilisation of larger and more complex stock items.

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THE DEAKIN COPING SCALE: STRATEGIES FOR THE MANAGEMENT OF DEMANDS

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Key words: challenge, resources, appraisal, coping, stress, demands, avoidance, management

ABSTRACT

The aim of this paper is to present The Deakin Coping Scale, a scale grounded in theory and in the qualitative reports of nurses' coping strategies. Data from 201 nurses working in public and private hospitals revealed four reliable factors: appraisal, challenge/commitment, use of social resources and avoidance, which together explained 57% of the variance. The factor structure was cross-validated among university students. A second-order factor analysis revealed these factors loaded onto a latent variable labelled management of demands that was stable across genders. Three factors contributed positively to the management of demands, while avoidance contributed negatively. The negative contribution of avoidance suggests that emotion-based strategies are not effective in the management of demands. Further studies need to investigate the utility of these factors in mediating the impact of stressors on nurses' wellbeing.

INTRODUCTION

Much empirical research over the past 30 years has attempted to assess the strategies that people use to deal with stressful situations. Despite the plethora of coping scales in the literature (Ways of Coping Checklist-Revised, Vitaliano et al 1985; Defense Style Questionnaire, Bond et al 1983), empirical support for the construct validity of these scales is often lacking and, in many instances, the scales also lack a strong theoretical grounding.

This paper reports on the development and psychometric properties of a coping scale grounded in Pearlin and Schooler's (1978) theory of coping, as well as the factors identified in previous qualitative research (Kipping 1998; Trygstad 1986) as the strategies nurses use to deal with demands.

The factors derived from the current scale were validated for use among nurses and, through confirmation of the factor structure among university students it is suggested that the scale is also relevant for more general populations. The current factors are discussed in relation to existing theory and nursing practice.

The results of this study provide a theoretically relevant and psychometrically sound instrument for measuring both adaptive and maladaptive strategies used in response to workplace and other stressors. The identification and measurement of adaptive management styles is particularly important among nurses because it is not just their own wellbeing that may be at stake, but also that of their patients. This instrument will supplement previous qualitative reports of nurses' use of coping styles in the literature.

LITERATURE REVIEW

Pearlin and Schooler (1978) were among the first researchers to provide a theoretical overview of the components of effective coping, yet current

operationalisations of coping have failed to address all of these components. According to Pearlin and Schooler, coping behaviour has a protective function that can be implemented in three ways: 1) coping strategies can eliminate or modify conditions giving rise to the problem; 2) the meaning of a problematic experience can be perceptually controlled in a manner that neutralises its character; or, 3) coping can act to keep the emotional consequences of problems within manageable bounds. Other theorists and the instruments evolved from their theories have addressed some but not all of these functions, and this deficit might explain why no comprehensive measure of coping has emerged.

Anna Freud (1966), for instance, described 'the ways and means by which the ego wards off ...anxiety, and exercises control over impulsive behaviour, affects and instinctive urges' (p.5) as defense mechanisms. Defense mechanisms are said to allow one to accept or cope with life's realities and the discharge of anxiety arising from these is seen as psychologically adaptive (Carr 1990; Raphael 1981). Thus, denial, repression, intellectualisation, humour and rationalisation are said to be normal and productive to the degree that they neutralise anxiety and allow a person to manage everyday life.

Bond et al (1983) developed the Defense Style Questionnaire (DSQ) to empirically evaluate and quantify people's use of these defense mechanisms.

Andrews et al (1989) subsequently reduced the DSQ to three secondary factors: mature (four first-order factors eg humour), neurotic (four first-order factors eg idealisation) and immature (12 first-order factors eg fantasy) defense mechanisms. Andrews et al (1989) found patients' differential use of these defense styles was clinically relevant in that they were associated with the patients' degree of psychopathology (ranging from phobias to obsessive-compulsive disorder) and the respective level of treatment difficulty of patients with these disorders. However, these factors have not been replicated among the general population (Spinoven, van Gaalen and Abraham 1995).

Furthermore, the focus of these defense mechanisms, and hence the DSQ, has been - in Pearlin and Schooler's (1978) terms - limited to coping with anxiety and reducing the emotional consequences of problems. While the reduction of emotionality is important for wellbeing and may allow individuals to deal with their stress, the DSQ does not directly assess how people might alter the meaning they attach to their problems, or how people might eliminate or modify their problems.

Folkman and Lazarus (1980) addressed this latter issue in their conceptualisation of coping that they see is comprised of problem-based and emotion-focused strategies. They specifically argued that problem-based coping is directed towards solving the problem and that problem-based coping involves both behavioural and cognitive components such as 'standing my ground and

fighting for what I want' and 'making a plan of action and following it'. The emotion-focused strategies involve attempts to avoid (eg slept more than usual), reduce (eg tried to forget the whole thing) and suppress (eg refuse to believe it had happened) anxiety in ways that are not dissimilar to the ethos of the DSQ. Both of these factors are addressed in their Ways of Coping Checklist (WOCC) but, like the DSQ, it too fails to demonstrate a robust factor structure across samples (eg Bruchon-Schweitzer et al 1996; Edwards and Baglioni 1993; Spinoven et al 1995). The WOCC also fails to assess the meaning that Pearlin and Schooler (1978) suggested people attach to their problems.

This lack of assessment of the personal meaning people attach to stressors is particularly surprising in light of Lazarus and Folkman's (1984) argument that people engage in an appraisal process in relation to potential and actual stressors. That is, a person asks 'What is the problem?' and 'Why is it a problem for me?', and it is only if the person decides that 'it is a problem for me' that he or she needs to engage coping mechanisms.

In this paper, coping is conceptualised not only as efforts to reduce emotionality and to find solutions to problems, but also as the ways in which people frame their experience so that their cognitive view reflects a sense of challenge and enhances the perception that the demands can be managed. It may be that this perceptual control, or reframing, as suggested by Pearlin and Schooler (1978), allows some people to see demands from a more positive perspective. In this way, it may be that some people, or most people at some time, see demands and problems as challenges to be met rather than as stressors to be dealt with or overcome.

The roles of coping described above, including those proposed by Pearlin and Schooler, have been independently endorsed in qualitative reports in the nursing literature. For instance, Trygstad et al (1986) reported that nurses interviewed by them cited a range of their own behaviours among the strategies they used most frequently in dealing with demands. These behaviours involved 'self-talk' relevant to nurses' perceptions, taking an active role, and talking to others. Similarly, Kipping (1998) identified social support and taking action to deal with the problem as the two strategies most frequently cited by psychiatric nurses to deal with their stressors. Nurses cited anxiety reduction techniques or emotion-focused coping strategies far less often. When mentioned, these emotion-focused strategies involved taking days off (avoidance) and joking with other staff (distraction/anxiety reduction).

It would seem, therefore, that Pearlin and Schooler's proposed strategies have received some empirical validation among nurses, albeit via qualitative data, but no instrument has been developed to empirically assess these domains. Another important strategy mentioned by

nurses in the Kipping (1998) study for dealing with demands was the use of personal resources, such as seeking advice or help from others. Social resources conceived in this manner might also be helpful in the resolution of issues and as such this support can be viewed in terms of a direct coping tool or strategy rather than simply as a support or a buffer against the subsequent effects of demands or stressors.

The aim of this study was to develop an instrument grounded in Pearlin and Schooler's (1978) theory of coping and supported by qualitative data, to assess these factors: appraisal, challenge/commitment, use of social resources, and the emotion focused strategy of avoidance. This instrument was then comprehensively validated using two separate samples: a sample of nurses and a sample of university students. The use of diverse samples is important during the psychometric assessment of an instrument, as instruments need to be robust across populations and contexts to enable meaningful future comparisons among groups and across situations. The psychometric properties of the scale were assessed via a series of statistical techniques, including principal components analysis, confirmatory factor analysis, and reliability analyses.

METHOD

Design

A series of questions was prepared to assess each of Pearlin and Schooler's three proposed coping strategies as well as the use of other people as a resource. After ensuring that there was no duplication and that the questions could all be answered on a five-point Likert format according to frequency of use (where 1=never and 5=always), 23 questions constituted the original instrument.

Participants

Two hundred and one nurses (87% female) participated in the study. Although there was a tendency for females to be older, there was no statistical difference in age between male ($M=32.33$ years, $sd=7.51$) and female ($M=40.98$ years, $sd=8.95$) respondents ($t 1.58$, $p= 0.130$). Seventy-eight percent of nurses reported they worked full-time. The majority of respondents worked in operating theatres (35%), while others worked in surgical wards (13%), medical, psychiatry and education (each 9%), and ICU (5%). However, 21% of respondents either failed to answer this question or indicated more than one unit. The majority of nurses reported having a postgraduate qualification (64%), 9% of nurses without a postgraduate degree said they were currently studying for one, and 28% of nurses reported either not holding a postgraduate qualification or were currently studying for one.

Five hundred and fifty-one first year university students from Deakin University (407 females, 144

males) whose mean age was 19.37 years ($sd=4.34$, range 17–45) completed the questionnaire as part of a larger study related to the demands associated with commencing university. These students were studying for a range of degrees including nursing, psychology, sociology and arts. No data are available on the numbers in each course.

Measures

All respondents completed the 23-questions written to form the Deakin Coping Scale (DCS). Nurses were asked to answer the questions with respect to problems typically encountered on the wards, while students were asked to answer the questions in relation to any problems or demands they may have experienced when commencing university some two months earlier.

Procedure

Ethical approval for this study was obtained from Deakin University. This study was advertised to nurses in the Australian Nursing Federation Victorian Branch Newsletter and via course coordinators of graduate nursing programs throughout Victoria and New South Wales, Australia. Nurses interested in participating in the study either completed a Web-based questionnaire or contacted the researcher on the telephone number provided to receive a hardcopy of the instrument together with a plain language statement and a reply-paid envelope.

First year university students wishing to gain research participation credits were required to participate in three of several studies advertised on university noticeboards. This study was advertised as 'an investigation of coping styles in relation to the demands associated with commencing university'. Students not wishing to engage in the research participation component were provided with an alternative way to achieve credit in that they could submit a previously nominated piece of work for assessment at pass/fail level. Students collected the questionnaire during scheduled classes, completed it in their own time, and returned it to the researcher via the internal university mail.

No response rates are available for either sample.

RESULTS

The data were analysed using SPSS/PC (Versions 6.1 and 9) and the structural equation modelling program, AMOS (Version 3.1) developed by Arbuckle (1997). The factor structure and internal reliability of the DCS items were investigated using principal components analysis (PCA) and Cronbach alpha (α) for the sample of nurses. A second-order factor, confirmatory factor analysis (CFA), was then used with the student sample to ascertain how the factors of the DCS contributed to the latent variable coping or, more specifically, the management of demands. A simultaneous CFA was conducted next to determine the robustness of the

DCS's factor structure across genders for the university group only.

Exploratory Factor Analysis

Principal components analysis with an oblique rotation was used to ascertain the factor structure of the DCS among the nurses. The Kaiser-Myer Olkin Measure of Sampling Adequacy (KMO) 0.740 and Bartlett's Test of Sphericity ($\chi^2=572.31$, $p<0.001$) both indicated the factorability of the correlation matrix for the initial 23 questions. Principal components analysis revealed five factors with eigenvalues greater than one (Gorsuch 1983). However, Cattell's Scree Plot, Tabachnick and Fidell's (2001) criterion of choice, suggested the presence of four factors.

After successive extractions and the removal of four items, the final solution produced simple independent structure with a four-factor solution. These four factors

explained 57% of the variance and were labelled appraisal (seven items), use of social resources (four items), challenge/commitment (four items) and avoidance (four items). Each factor demonstrated adequate internal reliability ($\alpha=0.64$ to 0.88) (Anastasi 1982). The factor structure, factor loadings, eigenvalues, per cent of variance explained and descriptive statistics are presented in Table 1.

Second-order confirmatory factor analysis (CFA)

In order to cross-validate the factor structure and to ascertain how the factors of the DCS would contribute to a broader understanding of how people manage their demands, a second-order confirmatory factor analysis was conducted using the larger student sample. The first-order factors extracted from the sample of nurses were loaded onto a latent construct labelled 'management of demands/stressors' (see figure 1).

Table 1: Factor structure of the Deakin Coping Scale

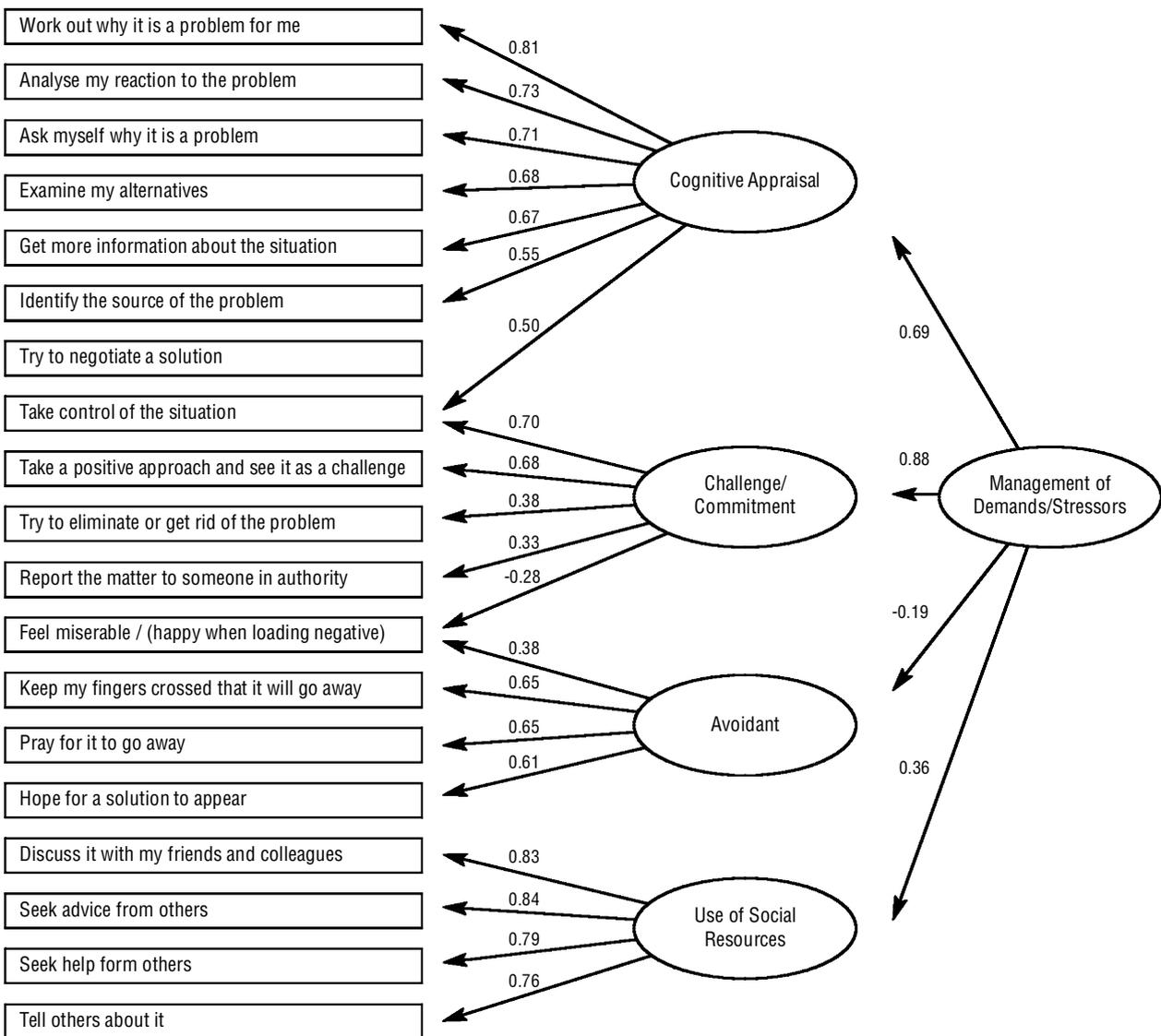
* Question	Factor 1	Factor 2	Factor 3	Factor 4
16 Ask myself why it is a problem	0.86			
1 Work out why it is a problem for me	0.85			
9 Analyse my reaction to the problem	0.80			
5 Examine my alternatives	0.71			
13 Get more information about the situation	0.63			
8 Identify the source of the problem	0.54			
14 Try to negotiate a solution	0.41			
3 Discuss it with my friends and colleagues		0.90		
11 Seek advice from others		0.86		
6 Tell others about it		0.85		
17 Seek help from others		0.83		
10 Pray for it to go away			0.78	
15 Hope for a solution to appear			0.76	
18 Keep my fingers crossed that it will go away			0.76	
12 Take a positive approach and see it as a challenge				0.68
19 Try to eliminate or get rid of the problem				0.61
7 Feel miserable about the situation			0.39	-0.61
4 Take control of the situation				0.58
2 Report the matter to someone in authority				0.43
Eigenvalue	4.98	2.57	2.04	1.23
% variance explained	26.23	13.50	10.74	6.49
Correlation matrix	1			
	0.24	1		
	-0.03	-0.06	1	
	0.33	0.22	-0.17	1
M	24.70	13.61	10.73	15.43
sd	5.02	3.40	3.21	2.87
α	0.85	0.88	0.68	0.64

* Questions have been renumbered to reflect the final 19-item questionnaire.

The Independence χ^2 (171) 3752.19, $p < 0.001$ confirmed the factorability of the matrix, and the data provided a good fit to the model (χ^2 [147] 501.81, $p < 0.001$, normed $\chi^2 = 3.41$; goodness of fit 0.91; adjusted goodness of fit 0.88; incremental fit index 0.90; comparative fit index 0.90; root means squares approximation 0.06. In addition to these indices, the single-sample expected cross-validation index (ECVI) suggested by Browne and Cudeck (1989) was 1.05 (90% confidence intervals 0.93:1.17), indicating the potential stability of the model in further samples. An appraisal of the situation, utilisation of social resources and perceiving the situation as a challenge for which one has a sense of commitment all contributed to the successful management of demands. The use of avoidant strategies did not (see Figure 1).

In order to determine whether this second-order factor structure was valid across genders, a simultaneous confirmatory factor analysis for males and females was conducted to test for equivalence using the students' data. This test revealed that the same factor model held true in both genders ($\chi^2 = 666.01$, $p < 0.001$; normed $\chi^2 = 2.261$; RMSEA 0.04, $pclose = 0.74$). Having accepted that the same factor model prevailed across gender, Arbuckle's (1997) further recommendation to constrain the factor pattern (ie the regression weights) to test for equivalence of parameter estimates across samples was implemented. This comparison revealed no significant difference in parameter estimates across the samples of males and females ($\chi^2 = 691.01$, $p < 0.001$; normed $\chi^2 = 2.23$; RMSEA 0.04, $pclose = 0.81$), providing further support for the stability of the factor structure across gender.

Figure 1: Confirmatory model of first-order factors loading on latent construct 'Management of Demands/Stressors'



DISCUSSION

The aim of the present study was to develop and psychometrically evaluate an instrument designed to assess how people cope with problems and demands upon them and to test the robustness of the factor structure in samples of nurses and students. The questions in the DCS were grounded in Pearlin and Schooler's (1978) theory of coping and qualitative reports of nurses' coping styles. The findings of this study, as well as providing good support for the empirical validity and reliability of the instrument, also attest to the merits of utilising both theory and qualitative data to produce an empirical scale.

Exploratory analysis of the initial 23-questions of the DCS in a sample of volunteer nurses working in a range of hospital wards yielded four factors: appraisal; challenge/commitment, use of social resources and avoidance, across 19 questions. All four factors exhibited satisfactory internal reliability and together explained 57% of the variance, which compares favourably to the 60% recommended by Hair et al (1995) as indicative of a sound scale.

Further support for the construct validity of these four factors is provided by the second-order CFA (Figure 1) conducted with data from a sample of university students. The CFA clearly indicates that the first-order factors (appraisal, challenge/commitment and use of social resources) are positive coping strategies which contribute to the management of demands, while avoidant strategies are negatively related to this second-order factor. This second-order factor structure was robust across genders.

The present findings add support to Pearlin and Schooler's (1978) conceptualisation of coping. These findings also contradict the proposition that problem-focused and emotion-focused strategies are both coping efforts; that is, that both 'consist of efforts ... to manage environmental and internal demands' (Lazarus and Launier 1978, p.311). The current model indicates that a strategy involving a sense of challenge/commitment aimed at controlling, solving or reducing demands, along with an appraisal of the demands (eg why is it a problem for me) and the seeking out and use of social resources, are coping efforts that contribute to the management of demands. Conversely, affective or emotion-based strategies, typified here by avoidance (eg hoped for a solution to appear, felt miserable about the situation), contribute negatively to the management of demands. This negative relationship might suggest that emotion-based reactions are not coping per se, but rather a reaction to the perceived demand or threat. In Pearlin and Schooler's study (1978), as well as in Freudian terms (see Anna Freud, 1966), these strategies may well be utilised to reduce or deal with the anxiety or distress experienced in relation to the stressor, but they do not contribute to solving the problem.

The current model (Figure 1) also shows that a challenge/commitment approach, operationalised by 'taking control of the situation', having a 'positive approach' and seeing the situation as 'challenging', is the strategy that contributes most to managing demands. This finding supports work based on the locus of control construct whereby people with an internal locus of control have been found to respond more adaptively to stress and its appraisal than those with an external locus (Krause and Stryker 1984; Parkes 1984; Perrewe 1987). A positive approach and the perception of demands as a challenge requiring commitment are also congruent with Kobasa's (1982) concept of hardiness to stress, which can be interpreted indirectly as the ability to manage demands.

The appraisal factor extracted from the Deakin Coping Scale contains elements of what Lazarus and Launier (1978) termed primary and secondary appraisal; that is, 'Why is it a problem for me?' and 'How can I negotiate a solution?' Clearly, such questions are important in individuals' determination of 'what' and 'if' situations are stressful. The use of available social resources, such as discussion with colleagues and seeking or taking advice and help from others, is also a necessary component of managing demands and problems given that stress, as a reaction, has been described by numerous authors as the discrepancy between perceived demands and perceived resources. The use of these strategies of appraisal and resources contribute to the management of demands.

The utilisation of these factors may be particularly important for the wellbeing of nurses working as part of a team where they may often be required to make important decisions. Nurses in particular, are often required to appraise demanding and/or stressful situations. If a problem does exist then they might well need to draw upon others as resources, and they need to perceive the situation as one of challenge to be overcome rather than a situation that is overwhelming. The use of avoidance strategies clearly will not be productive.

This instrument needs to be tested further among nurses in relation to a range of demanding situations, nurses' qualitative reports of how they see themselves as coping, and how the use of different coping styles contributes to subjective reports of health and wellbeing. The comparability of the factor structure of the DCS across nurses working in a range of wards needs to be confirmed in future studies employing larger samples.

CONCLUSION

The Deakin Coping Scale contains four factors that are theoretically relevant and psychometrically sound. The positive factors have been labelled an appraisal process (eg 'work out why it is a problem for me'), a utilisation of social resources (eg 'consulting with

others') and adopting a challenge/commitment approach to deal with the issue (eg 'take control of the situation'). Considered together, these factors contribute to one's ability to decrease threats and to manage demands. The use of avoidance strategies contributes negatively to the management of demands and is therefore inconsistent with the concept of emotion as a coping strategy. Further research is required to ascertain the mediating effect of these coping strategies between stressors and nurses' health and job satisfaction.

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APPENDIX A : Deakin Coping Scale

The following questions ask about how you deal with demands or problems (specify situation or leave open). Please answer every question by circling how much you engage in each of these techniques.

	Never	Rarely	Sometimes	Often	Always
1 Work out why it is a problem for me	1	2	3	4	5
2 Report the matter to someone in authority	1	2	3	4	5
3 Discuss it with my friends and colleagues	1	2	3	4	5
4 Take control of the situation	1	2	3	4	5
5 Examine my alternatives	1	2	3	4	5
6 Tell others about it	1	2	3	4	5
7 Feel miserable about the situation	1	2	3	4	5
8 Identify the source of the problem	1	2	3	4	5
9 Analyse my reaction to the problem	1	2	3	4	5
10 Pray for it to go away	1	2	3	4	5
11 Seek advice from others	1	2	3	4	5
12 Take a positive approach and see it as a challenge	1	2	3	4	5
13 Get more information about the situation	1	2	3	4	5
14 Try to negotiate a solution	1	2	3	4	5
15 Hope for a solution to appear	1	2	3	4	5
16 Ask myself why it is a problem	1	2	3	4	5
17 Seek help from others	1	2	3	4	5
18 Keep my fingers crossed that it will go away	1	2	3	4	5
19 Try to eliminate or get rid of the problem	1	2	3	4	5

THE COURSE OF DEPRESSION IN MOTHERS OF PREMATURE INFANTS IN HOSPITAL AND AT HOME

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Key words: premature infant, postpartum depression, NICU, family, psychological distress

ABSTRACT

The risk of continuing depression in mothers of very premature infants after discharge has not been studied in any depth. This study compared reports of maternal depressive symptomatology at one month after infant birth (Phase 1) and three months following infant hospital discharge (Phase 2). Fifty-two mothers completed the Edinburgh Postnatal Depression Scale at these two points in time. Results indicate that the percentage of mothers who reported high levels of depressive symptoms significantly decreased between Phase 1 and Phase 2. Logistic regression analysis indicated that depression scores at Phase 1 and maternal stress at Phase 2 were important factors in explaining depression scores at Phase 2.

BACKGROUND

In Australia, premature birth accounts for 7.3% of all births with approximately one in five of these being less than 32 weeks gestation (Day et al 1997). Over the past three decades, significant advances in the medical management of critically ill premature infants have resulted in unprecedented rates of survival of small premature infants especially those of extremely low birth weight (<1000grams) (Lee et al 1995; Vohr and Msall 1997; Raddish and Merritt 1998). These medically fragile infants can spend weeks and months separated from their parents receiving life saving treatment in the neonatal nurseries.

While the infant's hospitalisation is stressful for mothers, the transition home does not always mean the infant's problems are resolved and such circumstances introduce new challenges to parents' adaptation and coping ability (Affleck et al 1991).

Going home with their baby is often eagerly anticipated but can be stressful for parents who will assume full responsibility for an infant who for weeks or months has been regarded as medically fragile and in the care of experts (Easterbrooks 1988; Miles and Holditch-Davis 1997).

A number of studies have found that parents feel ill equipped to assume full responsibility for their infant at discharge (Brooten et al 1989; Kenner and Lott 1990). In the weeks following discharge parents continue to feel anxious about infant care issues, how to recognise infant illness, understanding growth and development and fearing for their infant whom they still view as sick (Brooten et al 1989; Kenner and Lott 1990). In many cases parents must give care to a sick infant whose needs

are beyond the needs of a normally developing infant (Patterson et al 1994; Sterling et al 1996). It has also been reported that premature infants are more difficult to parent than full-term infants, at least for the first year of life, as they tend to be less adaptable, less predictable, and fussier than their term counterpart probably because of neurological immaturity (Gennaro et al 1990; Gottwald and Thurman 1990). These aspects of the infant's behaviour and atypical infant responses may affect parent-infant interaction and complicate the developing relationship (Harrison and Magill-Evans 1996).

Together, these difficulties can create additional stress that can lead to depression (Mercer 1990) and mothers of these infants have been shown to be at greater risk of psychological distress than mothers of term infants (Pederson et al 1987; Gennaro 1988). However, there have been few studies into the extent to which depressive symptomatology continues for mothers after infant discharge. Studies have found initially high levels of maternal psychological distress in the neonatal period subsided by eight to 12 months after discharge (Brooten et al 1988; Singer et al 1999). However, women with premature infants have been shown to demonstrate evidence of depression prior to infant discharge and at one month after discharge (Logsdon and Davis 1997). In another study of maternal depression, 33% mothers of infants in NICU showed high levels of psychological distress, three to five weeks after infant admission and a further 41% were significantly distressed at six months - corrected for prematurity (Thompson et al 1993). Miles et al (1999) also reported elevated but comparable rates of depression at the time of hospital discharge (42%) and 12 months later (36%).

There has been little consensus regarding which mothers of very premature infants are most at risk and which maternal or infant characteristics best predict maternal depressive symptoms (Meyer et al 1995). Some studies have found that the severity of the infant's illness has been related to increased rates of depression (Blumberg 1980; Minde 1983; Singer 1999) but others have not (Gennaro et al 1990; Thompson et al 1993).

In general, research indicates that postpartum depression develops as a consequence of a complex interplay of biological and psychosocial risk factors (O'Hara 1997; Cooper and Murray 1998). Studies have also drawn attention to protective factors that reduce the risk of depression developing (Affleck et al 1991).

Social support research has established many links between supportive elements within family relationships and individual outcomes including psychological distress or coping with stressful life events (Pierce et al 1996). Researchers have found that the stress buffering role of social support was related to improved psychological adjustment in mother's of premature infants (Affleck et al 1991) and that parents who have effective social networks are better adjusted and interact in more optimal ways with

their child (Dunst et al 1986). Researchers are now examining both risk and resiliency factors in relation to postpartum depression.

Theoretical models have attempted to provide ways to understand how families adapt to differing stages of childhood illness including the birth and transition home of a very premature infant. The Resiliency Model of Family Stress, Adjustment and Adaptation (McCubbin et al 1996) suggests that two related but discernible phases mark a family crisis: namely adjustment and adaptation. Adjustment is described as the family's initial response to a crisis event during which the family attempts to meet demands utilising existing resources or resistance capabilities (McCubbin and McCubbin 1993). The adaptation phase describes the outcome of the family's efforts to bring about a new level of functioning in response to a family crisis situation (McCubbin and McCubbin 1993). During the adaptation phase the family attempts to restore family stability by acquiring new resources and coping behaviours. Families who are able to marshal their resources may respond with resiliency and adaptive functioning.

A family's coping behaviours consist of cognitive and behavioural efforts to manage psychological stress (Lazarus 1993). Family change and adaptation over time is the primary focus of the Resiliency Model and denotes the outcome of family efforts to bring a new level of balance, harmony, coherence, and functioning to a family crisis situation (McCubbin et al 1996). The Resiliency Model attempts to delineate post-crisis variables that may influence the family's ability to achieve adaptation, including critical psychological, social and coping factors that may affect adaptation.

In this study, the adjustment phase or Phase 1 (P1) denoted the period at one month after infant admission to a neonatal intensive care unit (NICU) while the mothers of very premature infants were in the process of adjusting to the crisis of premature birth. Those mothers who agreed to participate at P1 also gave consent for the researcher to visit them three months after their infant had been discharged home. This time was considered as the adaptation phase or Phase 2 (P2) when mothers had time to adapt to the practical and emotional effects of caring for their very premature infant.

PURPOSE OF THE STUDY

This paper reports the second phase in a two-phase study investigating variables associated with maternal reports of depressive symptomatology at three months after the infant was discharged from hospital (Phase 2). The results of the first phase (P1) are the subject of another paper, but generally indicated that many mothers suffered considerable psychological distress while their infant was hospitalised. The purpose of the second phase of the study was to visit these mothers again at three

months after infant hospital discharge to compare maternal depressive symptomatology and factors that influence depressive symptoms across time. Specifically, the study aims to determine if critical psychosocial and demographic factors measured at P1 and P2 are associated with depressive symptoms at P2.

Research hypotheses

- On the basis of the literature reviewed, it was hypothesised that: Mothers with a previous history of depression and limited formal education reported limited social support, high levels of stress and depressive symptoms, limited use of coping strategies, and with infants of low gestational age, birth weight and Apgar scores during P1 would report higher levels of depressive symptomatology at P2.

- After controlling for P1 depression: Mothers who reported limited social support, high levels of stress, limited use of coping strategies at P2 and had infants who had longer hospital stays and a high risk of developmental delay would report higher levels of depressive symptomatology at P2.

METHOD

Participants

All mothers of singleton premature infants born at less than 32 weeks gestation, without congenital anomalies and cared for at least three weeks in the neonatal nurseries of a local tertiary referral hospital were eligible to participate in the study. Mothers were required to be able to read and converse in English and live within a 200km radius of the participating hospital.

Procedure

The institutional and university ethics committees approved the follow-up protocol. Sixty-two mothers participated in the first phase of the study by completing a survey questionnaire at one month after infant admission to the neonatal nurseries. In giving informed consent, participants gave the researcher permission to visit them in their homes at three months after infant discharge from hospital.

At P2, all of the P1 mothers were contacted. Of the original 62 mothers, five were unable to be followed up due to infant rehospitalisation (two) and social issues (three). Four mothers were not traceable and there was one infant death. Fifty-two mothers made up the final comparison sample.

Instruments

Mothers completed a survey questionnaire which contained a number of previously validated research instruments drawing on the concepts contained within the Resiliency Model. This model focuses on the stress response (depression and stress measures), resources

a family has (ie support) and what a family does in response to a stressful event (ie coping behaviours). The questionnaires which were included are described below.

Edinburgh Postpartum Depression Scale

The 10-item Edinburgh Postpartum Depression Scale (EPDS) (Cox et al 1987) is a well-validated and widely used screening tool for depression after childbirth. Each item is scored on a 4-point scale (0-3), the minimum and maximum total score ranging from 0-30, respectively. In this study a score of 12 and above was used as a cut-off for depressive symptomatology.

Stress Scale of the Depression, Anxiety and Stress Scale

The stress scale of Depression Anxiety Stress Scales (DASS) (Lovibond and Lovibond, 1995) contains seven questions each scored on a 4-point scale (0-3), and a minimum and maximum total score ranging from 0-40. Higher scores indicate higher levels of stress.

Social Support Interview

The Social Support Interview (SSI) was designed to assess post-partum social support provided by, and given to, a participant's spouse/partner, closest confidant and closest parent (O'Hara et al 1982; 1983). The SSI asks the participant to give a rating from no person available (0) and never to always (1-5), for each identified sources of support (spouse, parent and confidant). Summing across the questions give a total support score ranging from 0-135. A high score reflects a high level of perceived support.

The Nurse Parent Support Tool

The Nurse Parent Support Tool (NPST) (Miles et al 1999) is designed to measure a mother's perception of nursing support during their infant's hospitalisation. Parents are asked to rate the amount of nursing support received on a Likert-type rating scale ranging from '1' almost never to '5' almost always. The scores are summed and divided by the number of items completed (21). The range of scores is from 1-5 with the higher scores reflecting a greater amount of perceived support from staff.

Coping Health Inventory for Parents

The Coping Health Inventory for Parents (CHIP) (McCubbin et al 1983) is a coping measure used to assess parents' appraisal of their coping responses when their infant is seriously ill. The CHIP consists of a checklist of 45 specific behaviours. The CHIP asks parents to record on a scale of 0-3, how helpful each behaviour is in their particular family situation. Summing across the questions gives a total support score with higher scores indicating greater satisfaction with coping behaviours.

Neurobiologic Risk Score

The principal researcher collected the following information from the maternal and infant hospital records.

The infant Neurobiologic Risk Score (NBRS) (Brazy 1991) was developed in response to the need for an assessment tool that provides early identification of infants who are at high risk for neurodevelopmental abnormality. The seven-item NBRS instrument uses a progression of scores (ie 0, 1, 2, 4) to assess the presence, duration and severity of a medical event. Three neurobiological risk groups are identified: Low risk (0-4), intermediate risk (5-7) and high risk (>8). The principal researcher and the director of neonatology determined the NBRS for participants from chart data after infant discharge. Maternal demographic data including education and a previous history of depression were collected. Infant data included birth weight (grams) gestational age (weeks) and total length of hospital stay (LOS).

Preparation for data analysis

An independent samples t-test was performed to compare the mean EPDS scores between those who continued in the study and those who were lost through attrition. Results indicated that the differences in the means were not significant ($p=0.477$).

Also, there was a difference in the timing of administration of the P2 questionnaire resulting from differing lengths of infant hospitalisation. To test if there was a relationship between length of time to follow-up and P2 depression scores, the correlation between the two variables was examined. Results indicated there was not a significant association between the length of time to follow-up and P2 depression scores ($r=0.148$, $p=0.136$).

Multivariable logistic regression analysis was carried out to examine the relationship between P2 maternal depressive symptomatology and a range of P1 and P2 variables associated with self-reported depression. In preparation for data analysis, bivariate associations were examined. Only those variables with significant associations with the dependent variable were entered into the final logistic model.

Results

The sample characteristics had not changed greatly from the P1 sample. The majority of mothers in the sample were born in Australia (94.2%). The mother's ages ranged from 18-42 with the mean age of 29 years (sd 5.5) and 77% (41) had completed secondary or tertiary education. While for 60% (31) of mothers, this was their first baby, a further 23% (12) reported that this was their first premature infant. Fifteen percent (8) reported having had a previous history of depression. An overwhelming majority of mothers (96%) reported having a supportive spouse or partner in whom they could confide.

The infants gestational ages ranged from 24-32 weeks with a mean of 28 weeks (sd 2.5) and birth weight ranged

from 513-2002 grams with a mean of 1092 grams (sd 365). Apgar scores at one minute ranged from 1-9 with a mean of 5.75 (sd 2.48) and Apgar scores at five minutes ranged from 1-10 with a mean of 7.71 (sd 2.25). Infants were hospitalised between 26-179 days with a mean of 70 days (sd 30). Neurobiological Risk Scores ranged from 0-15 with a mean of 2.7 (sd 3). A vast majority of infants 81% (42) fell within the range of low risk for developmental delay while 9.6% (5) were at intermediate risk and a further 9.6% (5) were categorised at high risk for developmental delay.

During P1 just over 40% (25/62) of mothers scored significant depressive symptomatology however this number decreased to 17% (9/52) at P2, a level similar to the population prevalence of 10-15% (O'Hara and Swain 1996). However of the mothers who suffered significant depressive symptoms at P2, all but one had been depressed at P1.

A separate paired samples t-test was conducted to formally test the significance of the change in the EPDS scores between P1 and P2. Results showed strong evidence for a drop in EPDS scores across time ($p=0.001$) ($P1=10.54$ to $P2=7.33$) indicating that mothers' depressive symptomatology did improve between the two time points. At P2, scores on the EPDS ranged from 1-25 (Mean 7.3 sd 5.29). Just over 17% (9) of the mothers scored >12 on the Edinburgh Postpartum Depression Scale, the threshold indicating probable depression (Cox et al 1987).

Initial bivariate associations of the P1 variables from the first hypothesis revealed that maternal socio-demographic and infant demographic were not statistically associated with the P2 depression scores. Only P1 depression scores were associated with P2 depression. To test the first hypothesis, a logistic regression examined the relationship between P1 depressive symptomatology and P2 depression scores. The logistic regression model were significant (2 12.93 (3), ($p<0.000$)). Depression scores reported while the infant was in hospital were significant ($p<0.05$) so that mothers who were depressed at P1 were 28% more likely to be depressed at P2 (OR 1.28 CI=1.02-1.59).

Bivariate associations with the P2 variables from the second hypothesis showed that maternal socio-demographic and infant hospital stay and morbidity risk were also not significantly associated with P2 depression scores. Only P2 stress scores were associated with P2 depression. Therefore only P1 depression scores and P2 stress scores were used in the final logistic regression model to examine the hypotheses of interest. After controlling for P1 depression scores a second logistic regression was conducted to examine the relationship between P2 depression and variables reported at P2. The logistic regression model was significant (2 20.99 (4), ($p<0.000$)). The mother's stress score was significant ($p<0.049$) indicating that as the mother's stress increased

the risk of depression also increased by 17% (OR 1.17 CI=1.00-1.35).

Discussion

The purpose of the study was to compare maternal reports of depressive symptoms across time and to test two hypotheses that certain maternal demographic, psychosocial and infant variables measured at P1 and P2 are associated with maternal depressive symptoms at P2.

It seems that maternal reports of depressive symptomatology decreased significantly at three months after infant discharge. This finding is consistent with previous work that showed that mothers experienced less psychological distress in the months after discharge (Brooten et al 1988; Singer et al 1999). However, the findings are not consistent with other studies that found elevated rates of maternal depressive symptoms after discharge (Thompson et al 1993; Miles et al 1999). It seems that evidence of continuing depression in mothers of very premature infants remains inconclusive.

The association between premature birth and postpartum depression has been reported in terms of women experiencing an adverse life stressor (Kumar and Robson 1984), or having an infant in NICU for an extended period (Gennaro 1988). However, the results from the current study can be interpreted in light of evidence suggesting that no one factor can be implicated as a 'cause' for postpartum depression; that it is a result of the complex interaction between biological and psychosocial risk factors (O'Hara 1997; Cooper and Murray 1998).

This suggests the birth of a very premature infant may not pose a threat to family adaptation in the presence of adequate family resiliency resources. The Resiliency Model examines the adaptational outcome as a function of the relationship between characteristics of the infant (degree of prematurity, birth weight, and neurobiological risk) and the characteristics of the mother (educational level) and the family's resources (social support and coping). The study's sample was generally well resourced with a majority of women living with supportive spouse or partner, having 12 years education or more, and infants who were at low risk for neurodevelopmental abnormality. It appeared that many mothers in the study had resolved their initial shock and by three months had adapted to the realities of caring for their premature infant as evidenced by the decrease in depression scores over time.

Nevertheless, the incidence of depression in this study is similar to the population prevalence and unlike mothers of full-term infants who experience shorter hospital stays, mothers of very premature infants remain in constant contact with the health care system until their infant is discharged. The neonatal period provides an ideal opportunity to screen for those women who may be most at risk. This provides an opportunity for staff to identify the mothers' depressive symptomatology and ensure

support systems are in place to reduce its continuation especially following discharge from hospital. The disabling symptoms of postpartum depression create disruption in family life when exceptional demands are being placed on a woman caring for a vulnerable infant (Holden 1994). In particular, the very premature infant is more vulnerable to the adverse effects of continued maternal depression because of his/her decreased responsiveness and increased need for appropriate stimulation (Field 1995). In order to prevent the development of more serious symptoms, it is crucial to identify and treat women with postpartum depression as early as possible (Beck 1998).

The first hypothesis was partially supported in that depression scores reported at one month after infant admission to hospital were significantly associated with depressive symptoms at three months post-discharge. There is a need for psychosocial and family services to be incorporated into neonatal follow-up services to evaluate maternal depression and adaptation since some studies have reported severe symptoms of psychological distress in mothers of high-risk premature infants at two years (Singer et al 1999). Referral for treatment may prevent the development of more serious symptoms that can have deleterious effects on the mother, family and infant.

The second hypothesis was also partially supported in that maternal reports of stress once at home with the infant were associated with depressive symptoms. While stress may be a result of many influences including the unique health care needs of an infant who may be temperamentally more difficult (Gennaro 1996), mothers were seen relatively early in the neonatal period when all young infants require substantial care giving efforts.

However, maternal stress and depression, through their impact on the quality of parenting and the caregiving environment, can have deleterious effects on parent-infant interaction, as well as the cognitive, emotional, and social developmental outcome of the infant (Sameroff and Fiese 1990). The effect of the other P2 variables including support and coping was not linked to P2 depression. Since the majority of mothers scored below the cut off for depression this result may reflect successful adaptive functioning when families are no longer in a state of crisis.

Other infant outcome variables including length of hospital stay and neurobiological risk were also not associated with P2 depressive symptoms. Although some studies have suggested that mothers whose infants were hospitalised longer may have a greater chance for physical and emotional recuperation than those with shorter stays (Brooten et al 1988; Tulman and Fawcett 1988), the length of hospital stay did not influence maternal depression in this study. Also, the severity of the infant's illness was not associated with depression, a finding supported by some studies (Gennaro et al 1990; Thompson et al 1993) but not by others (Blumberg 1980).

Results of the study need to be considered with caution due to the relatively small sample size; future studies would require a larger sample size to increase the study's power to detect effects, which are truly present. Results need to be interpreted within the limitations of the study, in particular the reliance on self-report data and the correlational nature of the study.

RECOMMENDATIONS

The findings have implications for health care policy given that the increased survival of very premature infants with neurodevelopmental abnormalities may lead to an intolerable family burden for those families with the least resources (McCormick 1997; Raddish and Merritt 1998). Findings from this study support the need for more longitudinal studies focusing on maternal stress and depressive symptoms in mothers of very premature infants and the factors that place a woman at continuing risk of depression. Once identified, postpartum depression is amenable to treatment. Early identification and intervention will promote family stability and enhance the long-term development of infants who are at both biological and psychosocial risk. Developing and practising preventive measures is cost-effective as well as humane and the importance of allocating scarce health care resources to prevention rather than treatment is increasingly acknowledged (Holden 1994).

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PROFILING THE 'PAIN-AWARE' NURSE: ACUTE CARE NURSES' ATTITUDES AND KNOWLEDGE CONCERNING ADULT PAIN MANAGEMENT

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Key words: pain, nurses' knowledge, attitudes, beliefs

ABSTRACT

Research about nurses' knowledge and attitudes regarding pain management shows both inadequate knowledge and inappropriate attitudes. The authors sought to explore this subject by surveying registered nurses (n=272) in a metropolitan teaching hospital about pain-related knowledge and attitudes/beliefs related to pain management.

Nurse knowledge was found to be of moderate standard only, with the best knowledge scores generated by the 'nursing assessment and management' section of the questionnaire. Associations between nurses' characteristics, attitudes and knowledge were assessed statistically.

Univariate and multivariate statistical procedures yielded a model predicting the profile of a 'knowledgeable nurse' as of younger age, less experienced, working in critical care, confident in knowledge of pain, holding views which accept that improvement in patient pain relief is needed and holding beliefs which value non-pharmacological nursing interventions. Potential explanations for this finding are discussed in light of the literature.

INTRODUCTION

Research into nurses' knowledge and attitudes regarding pain management continues to show inadequate levels of knowledge and inappropriate attitudes (Brown et al 1999; Brunier et al 1995). Most of the published research comes from North America and Great Britain. However, published Australian work demonstrates similar knowledge deficits and attitudinal concerns (Van Niekerk and Martin 2001; Heath 1998). Prominently reported knowledge deficit areas include issues related to pain physiology, pharmacology of analgesic drugs and risks associated with opioid drugs (Brown et al 1999; Cason et al 1999; Brunier et al 1995; McCaffery and Ferrel 1995).

Prominently reported negative attitudes and misconceptions are: patient pain assessment related; and, opioid related, ie inaccurate beliefs about tolerance and addiction (Heath 1998; McCaffery and Ferrel 1995). Specific attitudinal issues of concern which have been reported are: nurses' belief that patients over-report/under-report pain; that health professionals' estimation of pain is more valid than patients' self-report; and, that some patient behaviours (eg watching TV or reading) indicate absence of pain (Brown et al 1999; Brunier et al 1995; McCaffery and Ferrel 1995; Vortherms et al 1992).

Lack of knowledge and non-facilitative attitudes of health care professionals have been identified as major barriers to effective management of pain in hospitalised patients (Brockopp et al 1998). Ineffective pain therapy leads to needless suffering and may have serious consequences in terms of increased morbidity and financial cost. Nurses, as patients' primary carers, play a key role in the process of pain assessment and

management. The available literature is consistent in recommending that nurses' sensitivity and skills in caring for patients experiencing pain need to be enhanced (Cason et al 1999; Heath 1998). It is interesting to note that there is little consistent research based information about why nurse knowledge and attitude is inadequate.

The authors' experience in a metropolitan teaching hospital pain management service confirmed existing findings regarding inadequate knowledge and inappropriate attitudes. We sought to explore this phenomenon by conducting this cross-sectional survey of nurse characteristics, knowledge and attitude. Specifically, the study sought to: i) examine nurses' knowledge and attitudes related to pain management; and, ii) explore any existing associations between characteristics, knowledge and attitudes; among a sample of Australian acute care nurses, in order to inform knowledge and practice improvement strategies.

METHOD

This study was part of a larger project investigating pain-related knowledge and attitudes/beliefs among nurses at two sites (one adult, one paediatric) in eastern Sydney, Australia. Only data from the adult hospital is presented and discussed here.

Participants

All registered nurses (RNs) employed at a large metropolitan teaching hospital in Sydney, were invited to participate. Participants were not excluded on the basis of employment status (ie full-time, part-time or casual). The demographic characteristics of the sample are listed in table 1.

Measurement

At the time of the study, there was no known standard survey for assessing pain-related knowledge and attitudes/beliefs among Australian RNs. Therefore, the authors developed a questionnaire relevant to the Australian context. The survey comprised three sections: demographic data, questions applicable to knowledge of pain and questions applicable to pain-related attitudes and beliefs.

Section 1: Demographic data included items on level of education and training, clinical area and years of professional experience. In this section respondents also used a five point Likert scale (very good to very poor) to rate their perceived level knowledge for managing pain.

Section 2: Pain knowledge comprised 17 four-alternative multiple-choice items. The item breadth and content were guided by similar style pain knowledge surveys developed for use with nurses in other countries (eg McCaffery and Ferrell 1995; Brunier et al 1995; Ferrell et al 1993; Fothergill-Bourbonnais and Wilson-Barnett 1992) but it was adjusted for the

Australian setting. The items reflected the fundamental recommendations of the Australian National Health and Medical Research Council (NHMRC 1997). The following knowledge domains were canvassed: i) pain physiology and addiction issues; ii) nursing assessment and management; and, iii), pharmacological management.

Section 3: Attitudes and beliefs. The content of this section was developed in a manner similar to the knowledge section described above. This section comprised nine items which required respondents to indicate the level to which they endorsed each statement using a five point Likert scale (from strongly agree to strongly disagree). Attitude/belief items canvassed confidence, belief in adequacy of hospital approach to pain management, attribution of 'blame' for inadequate pain relief outcome, beliefs about the value of nursing interventions, and belief about the value of non-pharmacological interventions.

An independent panel of hospital-based experts in pain management (composed of three senior nurses and three specialist doctors) reviewed the item content of sections 2 and 3. The questionnaire was presented to the institutional research and ethics committee and approved following slight changes in the format and style of the survey. In its final form the questionnaire required approximately 15 minutes for a respondent to complete.

Procedure

The survey was distributed to all RNs with a cover letter indicating the purpose of the study and inviting voluntary participation. Completed surveys were returned anonymously by mail. According to institutional ethical guidelines, the decision to complete and return the questionnaire constituted consent to participate.

RESULTS

Sample characteristics

A total of 272 questionnaires were completed, representing a return rate of 41% from 661 distributed. The characteristics of the predominantly female sample are listed in table 1.

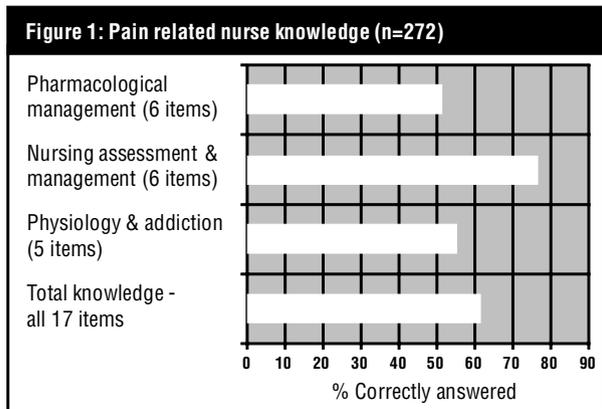
Table 1: Sample characteristics

Descriptor	Result (n=272)
Survey distribution/return rate	272/661 (41%)
Gender ratio - Female: Male	89:11
Age: Range, Mean (sd)	21-65; 34.2 (sd=9.4)
Years nursing: Range, Mean (sd)	0.2-40; 11.9 (sd=9.1)
Highest RN qualification	
Certificate	32%
Diploma	15%
Degree	41%
Grad Diploma	9%
Masters/PHD	2%

Pain-related knowledge

The 17-item knowledge test was collapsed to three knowledge domains (pharmacological management, nursing assessment and management; pain physiology; and, addiction issues). Results on the knowledge test are illustrated in figure 1.

Generally, performance on the knowledge test was of a moderate standard, with a mean sample score of 61%



for the whole test. Highest scores were achieved on issues related to nursing assessment and management of pain while knowledge of pharmacological issues attained lowest scores.

Knowledge test results and self-assessed knowledge ratings (very poor, poor, fair, good, very good) were cross sectionally analysed. Results from an analysis of variance indicated that there was no significant relationship ($F = -1.15; p = 0.33$), although, those who rated their knowledge as poor or very poor ($n = 8$), did score somewhat lower (10%) than all others ($n = 264$).

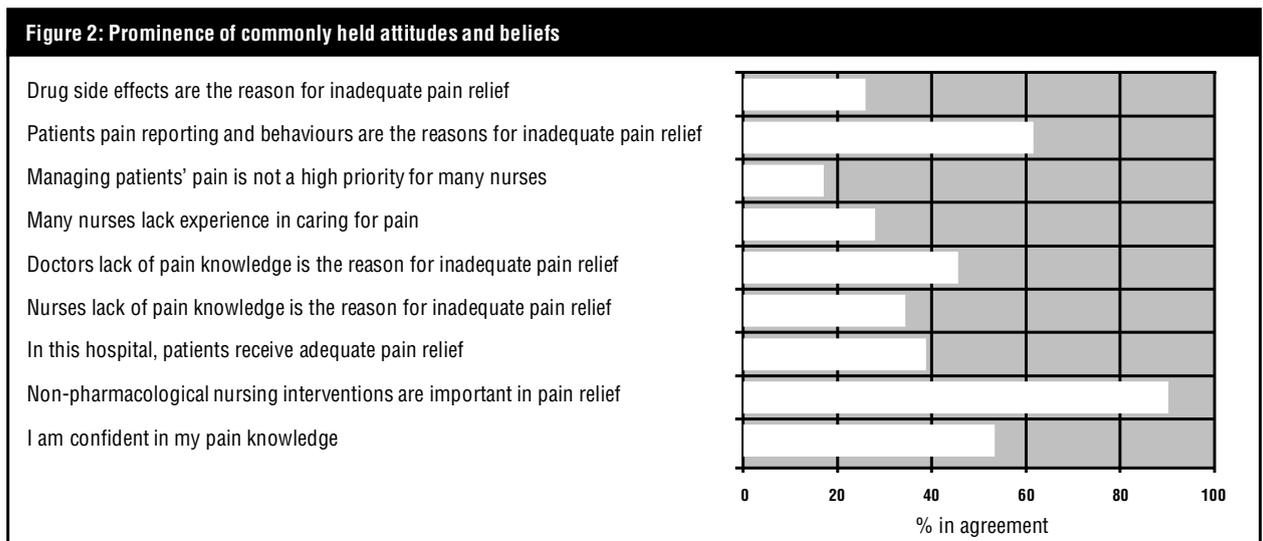
Knowledge test results were also analysed cross sectionally against major demographic descriptors. Results are summarised in table 2.

Pain-related attitudes and beliefs

A series of attitude/belief statements ($n = 9$) was included with the survey. These were assessed for prominence and were cross sectionally analysed against knowledge results, to test whether there were perceptual or attitudinal barriers to knowledge. Figure 2 illustrates the relative prominence of the attitudes canvassed.

Descriptor	Test	Direction of difference
Age (categories: 20-29; 30-39; 40-49; 50+)	Pearson correlation $r = -0.26; P < 0.0001$ Four age categories ANOVA: $F = 7.9; p < 0.0001^*$	Younger nurses scored significantly higher than older nurses
Gender	ANOVA: $F = 0.9; p = 0.33$	No differences
Highest nursing qualification	ANOVA $F = 0.48; p = 0.79$	No differences
Experienced in nursing adults in pain	ANOVA: $F = 2.08; p = 0.15$	Very modest positive difference in favour of nurses reporting pain management experience
Clinical area (medical, surgical, critical care or other)	ANOVA: $F = 3.02; p = 0.018^*$	No differences between 'medical' and 'surgical' codes, 'critical care' code scored highest and 'other' code lowest
Years of experience in the profession	Pearson Correlation $r = -0.24; p < 0.0001^*$	Significantly decreased scores among those with more years of experience

* $P < 0.05$



The two most prominently held beliefs were that: i) non-pharmacological nursing interventions are important in relieving patients' pain; and, ii) that patients' pain reporting (under or over) and associated behaviours are related to inadequate relief being given.

Association between attitudes/beliefs and knowledge test result

To establish whether these nine attitudes/beliefs mediated pain related knowledge, cross sectional analyses were conducted. Results are summarised in table 3.

Only two of the nine attitudes/beliefs were significant mediators of knowledge test result. Confidence in knowledge of pain was positively associated to knowledge on testing. Interestingly, belief in the value of non-pharmacological nursing interventions was also positively

associated with knowledge. None of the other attitudes/beliefs were found to significantly influence the knowledge test result.

Multivariate analysis – associations between demographics and attitudes on pain knowledge

Demographic and attitudinal factors that were found to be independently significantly associated with knowledge score were factored into a multiple regression analysis which sought to derive the best predictive model of total pain knowledge.

The resulting model accounted for 20% of the variation on the total knowledge score ($F=14.04$; $p<0.0001$, Adj $r^2=0.204$). It retained five significant predictors and is summarised in table 4.

Table 3: Knowledge score by attitude/belief rating

Attitude/belief	One way analysis of variance	Direction of difference
I am confident in my knowledge of pain	$F=4.2$; $p=0.003^*$	Knowledge significantly lower among those who express lack of confidence
Non-pharmacological nursing interventions are important in contributing to relief of a patient's pain	$F=6.4$; $p<0.0001^*$	Knowledge significantly lower among those who didn't think that non-pharmacological interventions were important
In this hospital patients receive adequate pain relief	$F=2.2$; $p=0.067^{**}$	Small knowledge decrease among those who believe their hospital provides adequate pain relief
If a patient does not receive adequate pain relief, it is because many of my nursing colleagues are lacking in pain knowledge	$F=1.4$; $p=0.23$	No difference by attitude/belief rating
If a patient does not receive adequate pain relief, it is because the medical staff lack pain knowledge	$F=0.70$; $p=0.59$	No difference by attitude/belief rating
Many nurses working in this hospital are not experienced enough in the nursing care of patients in pain	$F=1.14$; $p=0.34$	No difference by attitude/belief rating
Managing patients' pain is not a high priority for most nurses	$F=0.61$; $p=0.66$	No difference by attitude/belief rating
Two reasons for inadequate pain relief are that patients often don't report their pain or their associated behaviour is confusing	$F=2.35$; $p=0.054^{**}$	Marginally significant increase in knowledge among those who don't believe that patient reporting behaviours are influencers of pain relief adequacy
Pain relieving drugs have many side effects and this is the main obstacle in managing patient's pain	$F=1.0$; $p=0.41$	No difference by attitude/belief

* statistically significant ($p<0.05$)

** marginally statistically significant ($0.05<p<0.10$)

Table 4: Predictors of total knowledge score following multiple regression

Factors	Beta	t	p
Decreasing age	-0.25	-4.14	<0.0001
Not holding the attitude: 'In this hospital, patients receive adequate pain relief'	-0.28	-4.87	<0.0001
Holding the attitude: 'I am confident in my knowledge of pain'	0.13	4.09	<0.0001
Holding the attitude: 'Non-pharmacological nursing interventions are important in relieving patients pain'	0.13	2.70	0.007
Clinical area of employment is critical care	0.13	2.32	0.021

Results of the multiple regression demonstrated that younger nurses, confident in knowledge of pain, nurses not holding 'fixed' or 'parochial' beliefs, nurses who believed in nursing interventions and critical care nurses were those most likely to score well on the knowledge test.

DISCUSSION

Australian nurses appear to have similar deficits in pain knowledge as nurses in other countries. The present study found that performance on the formal measure of pain-related knowledge was of a moderate standard with a correct rate of approximately 61%. Various literature reports mean scores of between 41%-72% (Brunier et al 1995, 41%; Glajchen and Bookbinder 2001, 56%; Brown 1999, 65%; Cason et al 1999, 68%; Van Niekerk and Martin 2001, 72%). 'Pharmacological management' was the domain of weakest pain knowledge performance with a correct rate of 51%. This domain encompassed questions related to usage, doses and side effects of drugs. Encouragingly the strongest knowledge domain was 'nursing assessment and management' with a correct rate of 77%.

The implications of inadequate knowledge and inappropriate attitudes/behaviours on managing patients in pain are likely to vary. Wrong beliefs about high side-effect profile (eg respiratory depression, tolerance and addiction) may result in nurses seeing the pain relieving drugs as difficult to manage and, therefore, better to be avoided.

Lack of knowledge of pain physiology and principles of pain assessment may lead to beliefs that patients who don't actively report pain, are not in pain. Similarly, some nurses may not know that patients try to distract themselves from pain by watching TV or reading.

Attitude regarding patient pain behaviour was shown by this study to be a knowledge mediator. Holding the attitude 'patients often don't report their pain or their behaviour is confusing' was significantly negatively associated with knowledge ($p=0.05$).

In this study, younger and less experienced nurses were more knowledgeable (both at $p<0.0001$). De Rond et al (2000a) also found both of these correlations in their study of 227 Dutch nurses. Why this is so, is not clear. One may expect knowledge to climb with experience. In the case of pain management, perhaps its relative newness as a specialty to some extent hampers its 'uptake' among experienced clinical nurses. Perhaps attitude is generational and cultural and therefore 'deeply held' thus becoming a significant intermediary of knowledge in this area.

Critical care nurses were somewhat more knowledgeable about pain and its management than medical or surgical nurses ($p=0.02$). This might be reflective of a focus on analgesia in their postgraduate

educational preparation, their lower patient-nurse ratios, more 'controlled' clinical environment and a tendency towards the availability of more intensive educational infrastructure.

Wide variation was found among responses to the various attitude items canvassed. Some attitudes were more strongly held than others, though in each case attitudes did not attract a homogenous response. 'Non-pharmacological nursing interventions are important' was the most consistently held attitude - with 89.7% of respondents in agreement. This attitude was also positively associated with total knowledge score ($p<0.0001$). This is an interesting finding, as there is inconclusive scientific evidence for most of the non-pharmacological pain interventions, eg relaxation, breathing, distraction, music, visual imagery, biofeedback and transcutaneous electrical nerve stimulation (TENS) (NHMRC 1999; Sindhu 1996). Perhaps this attitude identifies nurses who feel positive about their profession and their practice. The other attitude which was shown to associate with better knowledge ($p=0.003$) was 'I am confident in my knowledge of pain' - this is a more straightforward relationship.

Multiple regression assisted in summarising the measurable characteristics of the 'knowledgeable nurse' from this study. The 'knowledgeable nurse' is: of a younger age; employed in critical care; confident in knowledge of pain; holding views which accept that improvement in patient pain relief is needed; and, beliefs which value non-pharmacological nursing interventions.

To address deficit of pain related knowledge most authors recommend a variety of education interventions. Many centres have implemented education programs for nursing staff (Brown et al 1999; Brunier et al 1995). Each had an underlying assumption that efforts to increase nurses' knowledge of pain may lead to improvements in pain management. A 1996 review by Francke et al suggested that continuing pain education for nursing staff can have an impact on both nurses and patients, however he admitted that the evidence was not conclusive. Howell et al 2000, demonstrated the effectiveness of an education intervention but the effect was not maintained over time. Some centres have reported little improvement in pain assessment and management by nursing staff (Dahlman et al 1999; Twycross 1997) following pain education programs. De Rond et al (2000b) demonstrated significant improvements post education in pain assessment but not in nurse-patient communication.

CONCLUSION

It seems likely that achieving the goal of adequate pain management as a norm for all patients may require more than education of nurses/health professionals. Attitude based interventions may also be potentially helpful. This study certainly indicates plenty of room for both

knowledge and attitude improvement, and hence the need for education. Increasingly we are promoting a more practical means of raising nurses' awareness of pain and its management by incorporating pain measurement into standard nursing observations. Today, we promote pain to nurses as 'the fifth vital sign'. As this axiom becomes embedded in everyday nursing practice and consciousness, optimal pain management for our patients may become a more accessible goal.

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RESEARCHING THE SEXUAL HEALTH NURSE PRACTITIONER SCOPE OF PRACTICE: A BLUEPRINT FOR AUTONOMY

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Key words: nurse practitioner, sexual health nurse practitioner, scope of practice, clinical protocols, health service, sexual health outreach

ABSTRACT

The nurse practitioner role substantially extends the career path for clinical nurses and recognises and values clinical nursing skills. This new type and level of health service promotes the use of a nursing model of care, demonstrates a high level of autonomy, and utilises expert nursing skills in the diagnosis and treatment of complex problems in the patient, the carer, and the family. This paper reports on the investigation of a sexual health nurse practitioner trial of practice. The study outcomes included findings that support the feasibility of the role in terms of improved patient outcomes and the development of clinical protocols that define the parameters of the scope of practice for the sexual health nurse practitioner.

INTRODUCTION

The Australian Capital Territory (ACT) Nurse Practitioner Project was conducted over a two-year period from 2000 to 2002 and followed similar undertakings in NSW (NSW Health Department 1995), Victoria (Victorian Government Department of Human Services 2000), and South Australia (SA Department of Human Services 1999). The ACT project was initiated by the Nurses Registration Board of the ACT in collaboration with the ACT Department of Health and Community Care. The project was conducted by a steering committee with a broad range of membership from professional and consumer health care groups. A major part of the project was the ACT Nurse Practitioner Trial. The aim of the trial was to conduct a trial of practice for four nurse practitioner (NP) models to inform the committee on the feasibility of the role in health service delivery in the ACT, the impact of the role on selected outcomes, and to define the parameters of practice for selected models. The definition of NP used for the ACT trial was:

A nurse practitioner is a registered nurse that works within a multidisciplinary team. The role includes extended practice in the autonomous assessment and management of patients using nursing knowledge and skills gained through postgraduate education and clinical experience in a specific area of nursing. The role may include but is not limited to the direct referral of patients to other health care professionals, the prescribing of a designated and agreed list of medications, and the ordering of a designated and agreed list of diagnostic investigations. (ACT Government 2002).

This paper will report on one of the models investigated in the trial - the sexual health NP model. The sexual health NP was based at the Canberra Sexual Health Centre (CSHC), located at The Canberra Hospital in the

ACT. The CSHC is the principal provider of sexual health services in the ACT and the surrounding region.

BACKGROUND

A review of the international literature indicates that while there is a strong body of research into NP service in general (eg Horrocks et al 2002; Kinnersley et al 2000; Venning et al 2000; Sakr et al 1999; Brown and Grimes 1995), there is scant research into sexual health NP models. Advanced practice models in sexual health nursing have been reported in the United States of America (Lewis and Miramontes 1999; Aiken et al 1993; Gifford 1993) and the United Kingdom (Bulaitis 2001; Liple 1999; Allen 1998; Friend 1998; Rowe 1994). However, each of these models deals only with a discrete aspect of sexual health care such as HIV education, counselling, or contraception.

There is limited literature on advanced practice in sexual health nursing in Australia. Two reports were located (Peckett 1997; Anderson et al 1994) that described advanced practice models that are narrow in scope without the legitimised extended practice necessary for the autonomy of a NP level of service.

A noted exception to the above is the Kirketon Road sexual health NP model in New South Wales described by Hooke et al (2001). The authors, in reporting on the evaluation study of this model, stated that the NPs in this clinic achieved a 95% agreement rating on accuracy of patient assessment and clinical management and overall achieved the standards for best practice. Furthermore, clinical outcomes were achieved in 97.2% of cases. However, the Kirketon Road model did not include the management of symptomatic patients nor did the NP deliver an outreach service. Both of these were included in the planning of the ACT model that was informed by the Kirketon Road model.

Sexual health clinics have traditionally been the primary means of delivering sexual health services to the community. These clinics, whilst an essential part of sexual health services, are insufficient in dealing with many of the broader issues. The majority of sexually transmitted infections (STIs) have no symptoms (Anderson 1999) and the social, cultural and economic influences of STI epidemiology mean that many individuals, especially those in high-risk groups, do not access sexual health screening or treatment facilities (O'Connor et al 1998). For these reasons provision of sexual health services out of a clinical setting (outreach) is essential and has been demonstrably successful elsewhere (Morton et al 1999; Wilson 1999; O'Connor et al 1998).

An outreach service, by its very nature, demands autonomous decision-making, a hallmark of a NP level of service (Mick and Ackerman 2000). Furthermore, a sexual health NP model that includes an outreach context has the potential to achieve positive health outcomes for

patients through the opportunistic management of sexual health issues. These factors contributed to the design and testing of the sexual health NP model for the ACT trial.

THE RESEARCH PROCESS

The aim of the study was to investigate: the feasibility of the sexual health NP role in health service delivery in the ACT; the impact of the role on selected outcomes; and, to define the parameters of practice for the model. Ethics approval was gained from the ACT Human Research Ethics Committee.

Data collection was conducted over a 10-month period and the NP was a co-researcher in the trial. A CSHC clinical support team comprising the medical director, the clinical nurse consultant and the senior sexual health registrar provided clinical teaching and supervision. This strategy ensured patient safety whilst enabling the NP to extend her skills and engage in experiential clinical learning opportunities.

Patient recruitment

Patients were recruited through the CSHC and on outreach activities. All patients who presented to the CSHC were triaged by the director and the clinical nurse consultant to either i) a medical specialist, ii) the nurse practitioner, or iii) a sexual health nurse. The NP then provided her group with information about the trial and invited them to participate. All patients recruited in the outreach setting were from sex-on-premise venues and were commercial sex industry workers. Any patients who declined in either setting were provided with the standard level of nursing care.

Data collection

The data collection tools were adapted from the NSW Nurse Practitioner Project (NSW Health Department 1995). Data collection included:

- *Diagnostic and demographic details of the patients seen by the nurse practitioner*

Analysis of these data determined the pattern of service for the model and informed the patterns of practice for development of clinical protocols.

- *Consultation details and treatment, investigative, and referral decisions made by the NP*

Analysis of these data informed the specific details for the clinical protocols. These in turn defined the parameters of autonomous practice for the NP.

- *Data relating to the clinical team's review of the NP's clinical decisions*

Analysis of these data provided information on the safety of the NP service and in turn also informed the development of the clinical protocols for the model.

- *Patient outcomes*

This related to the safety and effectiveness of the NP level of service.

- *Survey of patients who received NP service*

Analysis of these data provided a consumer perspective of the service.

- *Survey of health professionals related to the clinical service*

The health professionals survey informed the feasibility of the NP role as a new level within existing health service.

RESULTS

This trial provided information about the impact of this level of service on sexual health outcomes in the ACT and surrounding region and defined the scope of practice for this model. The results will be reported in terms of the patients, their health care outcomes and satisfaction with the health service, and the pattern of NP service.

The patients

Patient demographics

Seventy-six patients were enrolled in the trial. These patients generated 79 episodes of care totalling 134 visits with an average of 1.8 visits per episode. An episode of care was deemed to be the duration of care for a particular presenting issue from when the patient first saw the NP until treatment by the NP for that issue ceased. One patient declined to participate. A number of potential recruits in the outreach venues were not asked to participate because of ethical implications related to language barriers and informed consent. In these cases there was no access to a language-relevant interpreter.

The age of patients ranged from 18 to 59. Most patients (82%) were younger than 39. This represents a group in their reproductive years for which the implications of morbidity from the transmission of STIs, particularly chlamydia, are a concern.

There were 31 women (41%) and 45 men (59%) enrolled in the trial. Commercial sex industry workers were targeted in the outreach setting; consequently women represented the majority of episodes of care (86%).

Patient outcomes

Data on patient outcomes were collected for 79 episodes of care. The patient outcomes were reviewed for each episode of care in collaboration with the clinical support team. This review revealed that expected outcomes for all identified problems for the patient were achieved in 100% of the cases followed up. Further analysis revealed that patient outcomes conformed to one of three elements of service described below.

Access to sexual health services

A substantial number of outreach patients stated that they would not have attended either CSHC or another health care facility for their sexual health needs. The reasons given included: sex industry workers living on brothel premises and having no transport; language barriers; drug and alcohol issues; and mental health issues. Three commercial sex industry workers who were screened all had a positive result for chlamydia, were still providing sexual services to their clients, and had at least two 'regular' clients with whom they had unprotected sex.

Successful treatment or management of an STI or related genito-urinary condition

There was resolution of symptoms for 100% of patients presenting with genital lumps, sores, rashes, and vaginal or urethral discharge. All patients diagnosed with a treatable STI were given appropriate treatment and where possible a test of cure was carried out to ensure that the antibiotic initiated was effective. For patients with a genito-urinary condition there was resolution of urinary and/or vulvo-vaginal symptoms post initiation of antibiotic therapy or other management strategies.

On some occasions cryotherapy was used for the management of STIs. There were six out of 11 patients with either genital warts or molluscum contagiosum for whom cryotherapy was initiated as a mode of treatment. These patients had either a reduction or a resolution of their skin lesions as documented on their outcome data sheet.

Health maintenance and health promotion

Currency of sexual health screening for patients was an important outcome. This currency is essential in the outreach context, in that it is a breach of the ACT Prostitution Act (1992 Section 16) to provide a sexual service if infected with a notifiable STI. This outcome is also important considering the asymptomatic nature of STIs and that screening is the cornerstone of STI control in terms of public health.

The primary prevention strategy identified in the patient outcomes data was the uptake of vaccination against hepatitis B. Other prevention strategies were education around negotiating safer sex practices; the use of condoms, dams, and lubricant; smoking cessation; safer injecting; and drug and alcohol use; all designed to reduce the communicable diseases burden.

Patient satisfaction

Surveys were used to obtain a customer focus on the NP service. Survey questions related to knowledge of the NP service, satisfaction with the service, and willingness to see a NP again. Extended answers were invited on what the participant liked, and did not like about the service. These surveys were anonymous and returned directly to the chief investigator of the ACT trial. There were 23

surveys distributed between September and November 2001 of which 14 were returned.

Analysis of the survey data indicated that the NP level of service was well accepted by patients. All patients agreed they would see a NP again and all either strongly agreed (12) or agreed (2) with the statement: 'I was satisfied with the consultation/s provided by the NP'. All 14 patients were satisfied with the information provided. The majority claimed an improvement in their health problem, three indicated that this question was not applicable to them, and two were undecided. Comments from the patients focused on the 'user-friendliness', non-judgemental attitude, and quality of the NP level of service.

The sexual health NP service

There was a difference between the clinic and outreach venues in the patients' presenting issues, with clinic-based patients more likely to be symptomatic (30%) than those at an outreach venue (20%). The primary focus of the outreach clinic was sexual health screening and addressing concerns about contracting an STI. These accounted for 54% of the presenting issues.

The NP provided health service to the target groups identified in strategic sexual health documents (ACT Department of Health, Housing and Community Care 1998; Commonwealth Department of Health and Aged Care 1998). The patients from these at-risk groups included commercial sex industry workers (15), clients of commercial sex industry workers (7), men who have sex with men (3), and intravenous drug users (IVDU) (6).

The average length of a patient visit was 37 minutes. The three most common presenting issues for patients were:

- requests for sexual health screening (33%);
- concerns about being at risk of acquiring an STI (29%);
- symptoms such as vaginal or urethral discharge, genital blisters, lumps, or rashes (25%).

The remaining consultations were divided among: treatment revision; requests for medication, including vaccination; psychosexual issues; and other issues unrelated to sexual health.

Sexually transmitted infections that were diagnosed, treated, and managed included chlamydia, gonorrhoea, genital warts, genital herpes, molluscum contagiosum, and pubic lice. Three patients with chlamydia infections were sex workers who spoke no English and were screened on outreach brothel visits with the assistance of an interpreter. One had vaginal discharge and was treated empirically at the venue while the other two who were asymptomatic were treated the following week after the pathology results were available.

The genito-urinary conditions that were managed included vulvo-vaginal candidiasis, bacterial vaginosis, urinary tract infection, non-specific urethritis, and tinea cruris. Skin conditions such as eczema and dermatitis were also managed.

Recommending medication

Fifty-nine percent of consultations resulted in the initiation of medications. These medications were most commonly STI related antibiotics, anti-mitotics, immunomodifiers and antivirals. Additionally genito-urinary related preparations were prescribed such as antifungal preparations for vulvo-vaginal candidiasis and antibiotics for bacterial vaginosis and urinary tract infection.

Hepatitis A and B vaccine were also a feature of clinical service in this model with hepatitis B vaccine being the most frequently initiated medication.

Hormonal contraception was a feature of this model where it represented 11% of the medication initiated. There was evidence of a demand for emergency contraception, the oral contraceptive pill, and medroxyprogesterone acetate injections in relatively equal numbers.

The medication formulary for the model was developed from these data (see table 1).

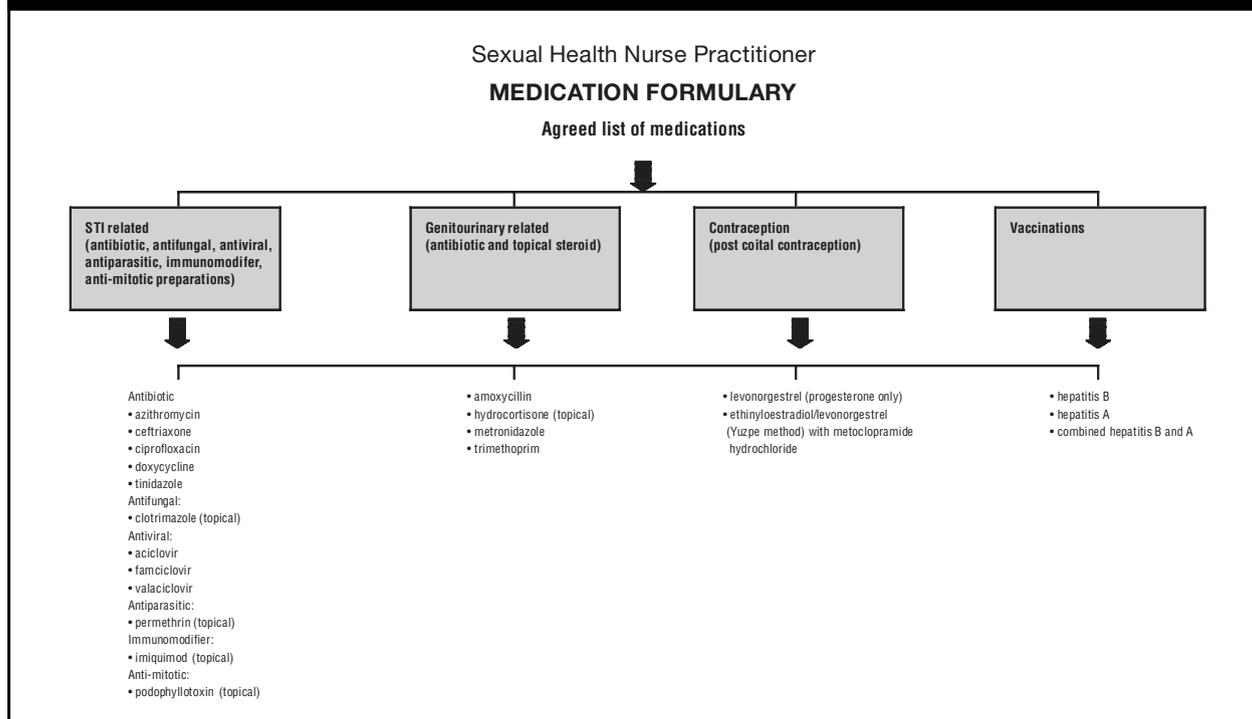
Initiating diagnostic pathology

Seventy-six percent of the patients in the trial had some type of pathology generated and there were 282 diagnostic investigations ordered. The bulk of diagnostic pathology was to screen for STIs using microscopy, 43% and serology, 52%, for blood borne viruses. On-site microscopy was done on a number of occasions to confirm a clinical diagnosis of common STIs and genito-urinary conditions. Pap and vault smear (cytology), urinalysis, and midstream urine microscopy tests also feature in the diagnostic pathology data but in small numbers. Biochemistry and haematology were only done prior to a medical referral.

Referral patterns

There were 24 referrals initiated during this trial. Six referrals were to the sexual health social worker for psychosexual issues requiring intensive counselling, and four to the sexual health medical registrar for management of patients who were outside the NP's scope of practice. There were six referrals to general medical practitioners for either ongoing care or for management of medical issues that were not sexual health related. Other referrals were to community services providing psychosocial support such as mental health or sexual assault services.

Table 1



NP clinical reasoning skills

For the duration of the trial there were weekly, hour-long clinical review sessions with members of the clinical team. During these sessions each consultation was discussed and critically evaluated, and recommendations were made for future clinical practice. These review sessions monitored safety of practice and appropriateness of the NP's clinical decisions. They also met the clinical learning needs of the NP by providing collaborative critique and analysis of clinical management decisions and options. There were 120 clinical review forms completed with an agreement rate between the clinical team and the NP of 98%.

DISCUSSION

The analysis of data in the sexual health NP model describes the patients managed by the NP and illustrates this practice. The analysed data relating to the service was subjected to interpretive scrutiny and triangulated with the descriptions of practice from the clinical review and clinical outcomes data to develop the clinical protocols and medication formulary. This discussion section reports on this process.

One of the recommendations from the Kirketon Road study (Hooke et al 2001) was that protocols and policy be developed to guide NP practice. Clinical protocols were developed in the ACT NP Trial as a mechanism for defining and communicating the scope of practice of specific NP models. The protocols represent a general guide to appropriate practice. They are inclusive rather than prescriptive and the aim is to provide information on

which decisions can be made rather than dictate a specific form of diagnostic and treatment strategy. Whilst Hooke and her colleagues (2001) recommended the development of standing orders for a range of medications, within the scope of practice defined by the protocols and the accompanying medication formulary from this trial the NP has full prescribing rights and discretion and autonomy in practice.

The context

The results indicate that in the outreach context, the sexual health NP level of service is accessed, well accepted, and effective in both a neutral venue in Canberra's central business district and at sex-on-premise venues. The sexual health NP had the facility to reach locations and populations that do not usually access sexual health or other support services.

There is also a demonstrated role for the NP level of service in a clinic-based setting as indicated by the volume of asymptomatic screening completed and the numbers of symptomatic patients managed.

The pattern of practice and the scope of practice

As indicated by the results a sexual health NP level of service is accessible and acceptable to both sexes and a range of age groups. Of particular note is that this service was both 'youth and male friendly' and this has application for targeting these groups with an outreach strategy. Other groups who are at risk of STIs seen by the NP were commercial sex industry workers, clients of commercial sex industry workers, and intravenous drug users.

Analysis of the data revealed a pattern of practice that can be categorised into four key areas: management of i) asymptomatic screening, ii) STIs and related genito-urinary conditions, iii) contraception, and iv) opportunistic management strategies. These areas informed the clinical protocols and medication formulary that were developed to define the scope of practice for the sexual health NP model.

Whilst describing categorical areas of practice, the clinical protocols collectively define the scope of practice for the sexual health NP. These protocols extend the specialist nurse role to the NP level of clinical practice whilst also defining the boundaries of the role. That is, the clinical protocols and medication formulary are the guidelines within which the NP can provide autonomous clinical service. Each of these clinical protocols will be discussed, explicated, and schematically represented.

Asymptomatic screening

Asymptomatic screening formed the bulk (54%) of the sexual health NP episodes of care during the trial. The elements of asymptomatic screening were identified through examination and triangulation of data from the patients' presenting issues, NP diagnoses, and patient outcomes. During asymptomatic screening patients were screened for the most probable STIs, other sexual health issues within the scope of practice were managed, and referral initiated for other health or psychosocial issues.

Asymptomatic screening requires the use of specimen testing. Some of these were performed on the spot at the clinic and the hospital pathology department conducted the remainder. As demonstrated in the previous section there was a large amount of serology testing (52% of total) and microscopy (43%).

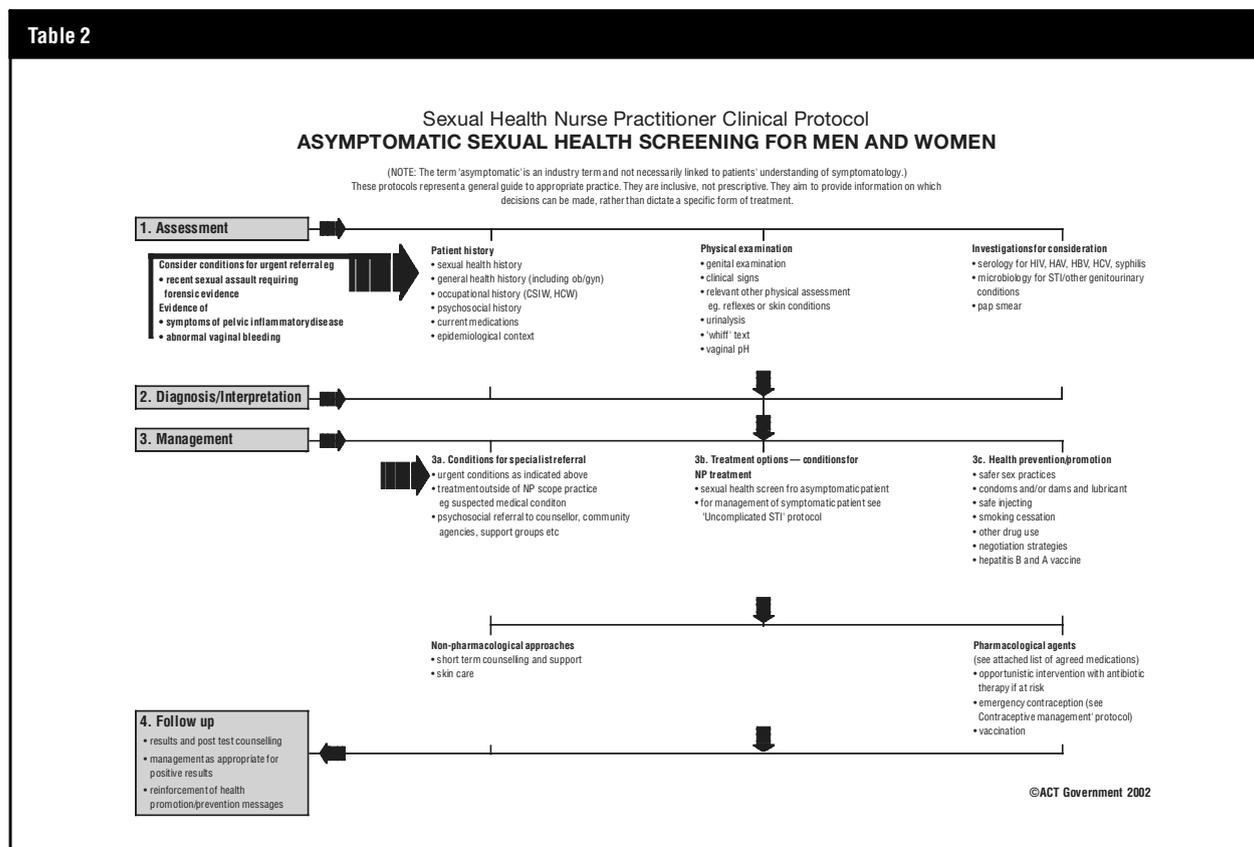
Hepatitis A and B vaccination was a feature of the NP initiated medication in asymptomatic screening. This highlights the importance of being able to initiate medication from a well-defined formulary. See table 1 for a schematic representation of the medication formulary and table 2 for the 'Asymptomatic sexual health screening for men and women' clinical protocol.

Management of uncomplicated sexually transmitted infections and related genito-urinary conditions

The management of STIs and related genito-urinary conditions was a core part of the sexual health NP service during the trial. The data relating to 'patient diagnosis' determined the STIs and related genito-urinary conditions that fell within the parameters of this model. The diagnostic pathology used in patient management was similar to but more complex than for asymptomatic screening and included additional tests like microscopic-urine and herpes serology.

The results show there were specific medications associated with STI and related genito-urinary conditions used in the trial. The use of these medications in the

Table 2



management of STIs and related conditions is an essential component of this model. The results indicate that the appropriate and safe use of these medications was achieved and there were positive patient outcomes. The medication formulary was reviewed and approved by an expert panel comprising a medical specialist (chair), a pharmacist, and a NP from the NSW trial. The members of this panel were not otherwise associated with the ACT NP Project. See table 3 for a schematic representation of the 'Management of uncomplicated sexually transmitted infections and related genito-urinary conditions' clinical protocol and table 2 for the medication formulary.

Opportunistic management strategies

A major strength of this model is the facility for opportunistic management of a range of sexual health issues in multiple settings. The portability of this model lends itself to the prevention of transmission of STIs by both screening for, and treatment of, these conditions in any number of settings.

Providing sexual services without personal protective equipment (PPE) such as condoms or dams is illegal in the ACT. Providing sexual services while infected with an STI with or without PPE is also illegal and furthermore represents a potential public health risk. Commercial sex industry workers may provide a sexual service for between three and 25 clients per day but may not have access to this knowledge for the reasons cited previously. The outreach element of this trial enabled more than

clinical treatment of individual patients; it included opportunistic education, advocacy, and increased access to health service for these groups. In addition the model facilitated collaboration with the staff and management of a range of community sex industry organisations. This collaboration ensured that relevant stakeholders and consumers were involved in the planning, implementation, and evaluation of the outreach services.

The model also has the ability to reduce the number of cases of hepatitis A and B through the opportunistic vaccination of patients. Furthermore, the initiation of hormonal contraception, particularly emergency contraception, in this way has the potential to reduce the number of unplanned pregnancies. Importantly, opportunistic intervention in this model goes beyond medication and includes health education, health promotion, and referral to other health or psychosocial services. See table 4 for a schematic representation of this clinical protocol.

Contraceptive management

Emergency contraception was the hormonal contraception included within the scope of practice for this model. There was insufficient clinical exposure and resulting data in the trial to include the oral contraceptive pill and medroxyprogesterone acetate in this clinical protocol. However, the facility to prescribe these preparations should be considered in further developments for this model (see table 5 for a schematic representation of this protocol).

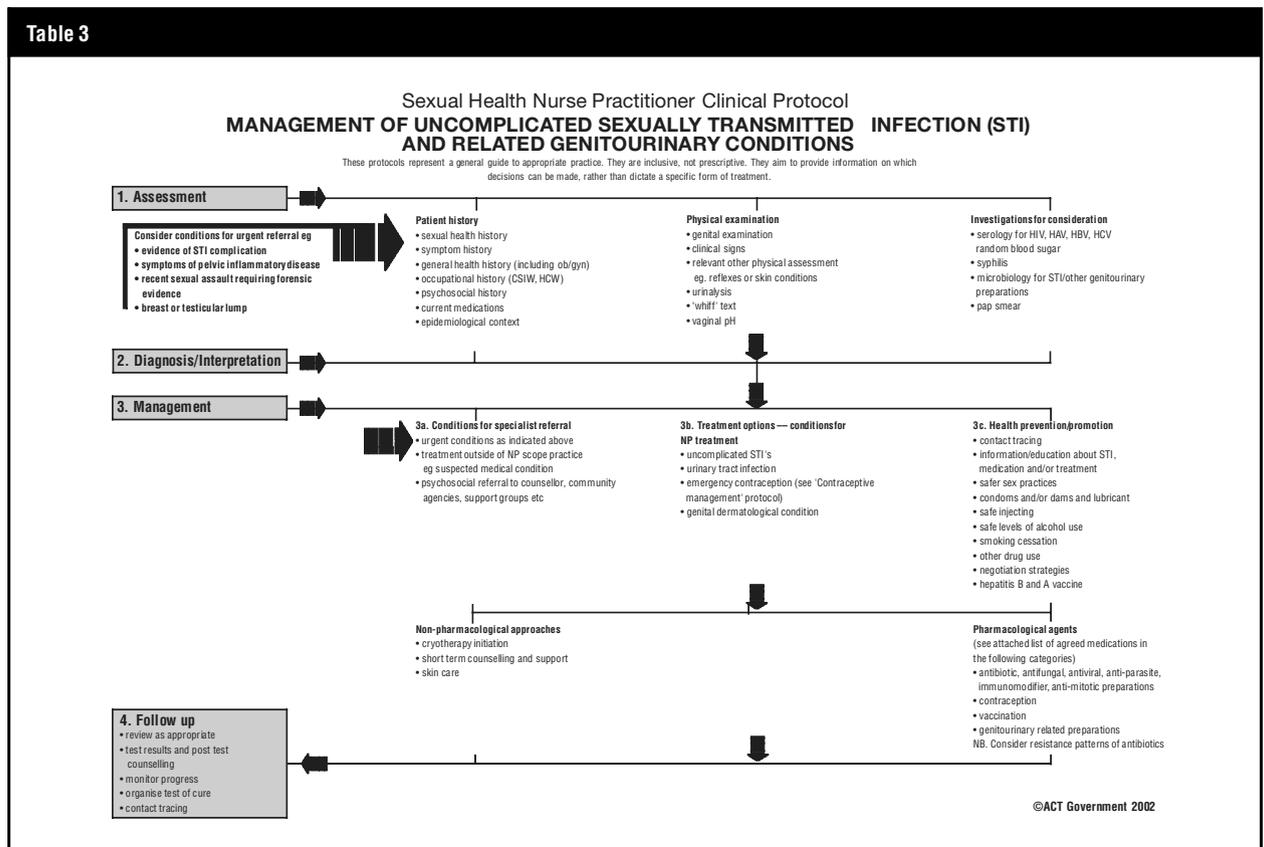


Table 4

Sexual Health Nurse Practitioner Clinical Protocol OPPORTUNISTIC MANAGEMENT FOR PATIENTS WITH SEXUAL HEALTH PROBLEMS

These protocols represent a general guide to appropriate practice. They are inclusive, not prescriptive. They aim to provide information on which decisions can be made, rather than dictate a specific form of treatment.

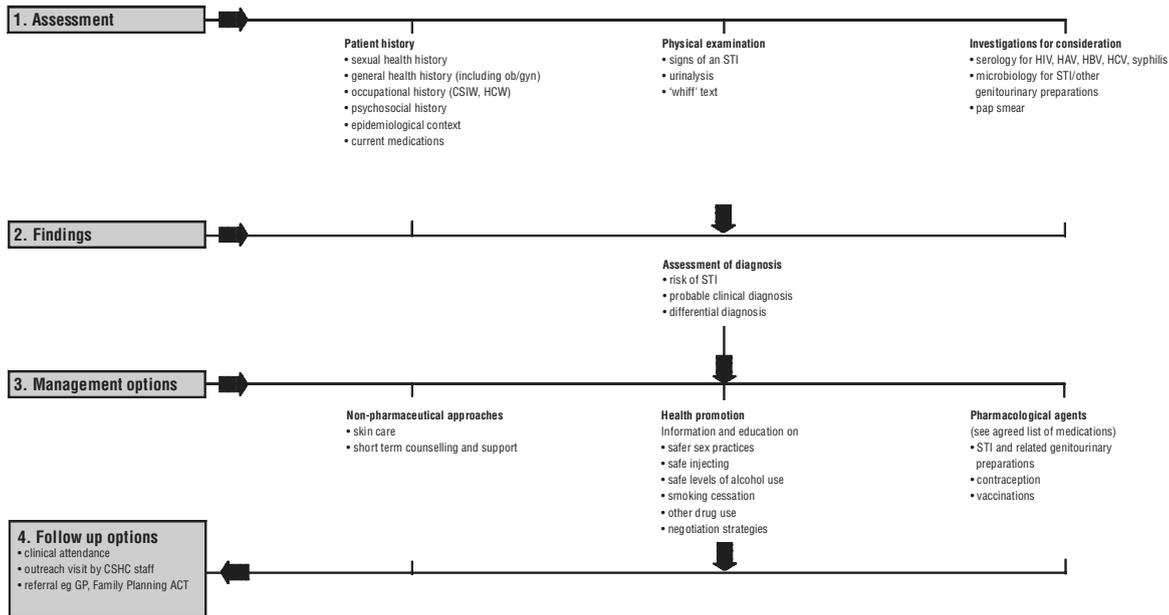
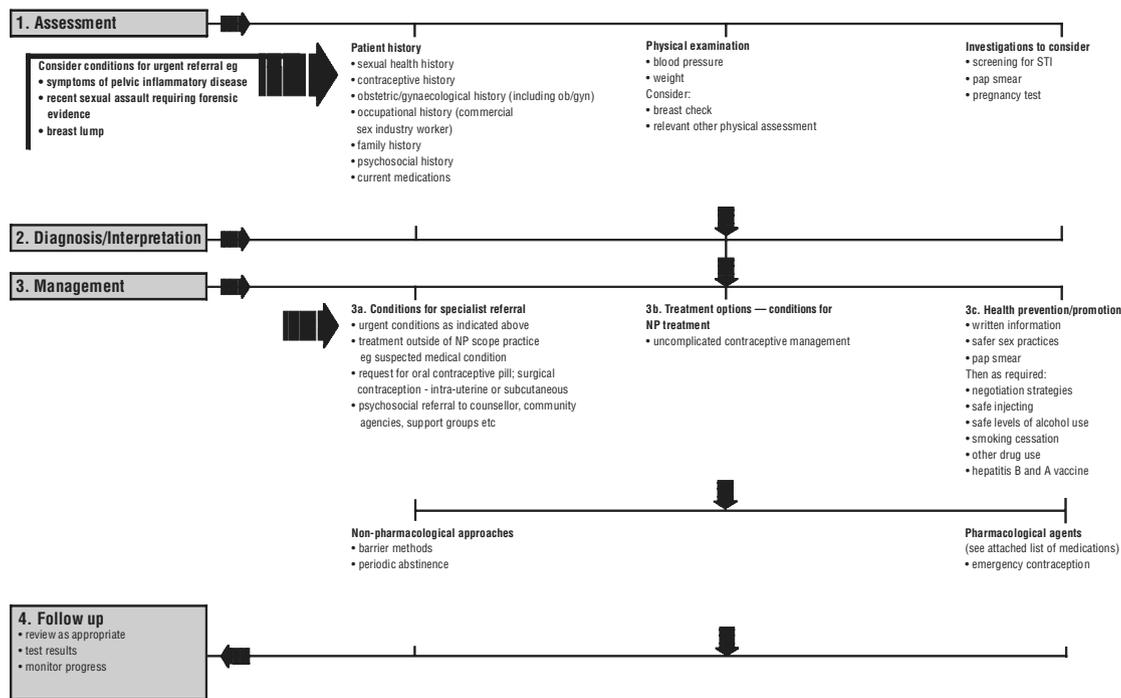


Table 5

Sexual Health Nurse Practitioner Clinical Protocol CONTRACEPTIVE MANAGEMENT

These protocols represent a general guide to appropriate practice. They are inclusive, not prescriptive. They aim to provide information on which decisions can be made, rather than dictate a specific form of treatment.



CONCLUSION AND RECOMMENDATIONS

This paper describes a trial of practice for the sexual health NP model that was conducted as part of the ACT NP Project. This trial of practice has generated data to demonstrate that the NP delivered effective clinical management, patient education and health promotion, and referral services for patients with a variety of sexual health issues. These sexual health issues included screening for and treatment of sexually transmitted infection, management of select genito-urinary conditions, and initiation of contraception. This model has a major strength in the ability to intervene in an opportunistic fashion for sexual health issues and has been shown to be accessible and acceptable to a variety of patients in multiple settings and has the benefit of accessing marginalised and/or at-risk groups.

This trial of practice has demonstrated that NPs are a feasible addition to sexual health services in the ACT health system. Furthermore, this NP service is well placed to positively impact upon the psychosocial health, morbidity, and mortality associated with sexually transmitted infections, blood borne viruses, and related sexual health issues. The implementation of this level of service will contribute to optimal sexual health of the ACT community.

This study supports the need for legislative change relating to protection of the title of NP and legitimisation of extended practice. Further to this, we recommend to other clinicians and researchers in the field that the clinical protocols and medication formulary are appropriate to structure the parameters that define the scope of practice for the sexual health NP model.

These protocols and the medication formulary are sufficient and necessary to inform prescribing, ordering of diagnostic studies, referral privileges, and therapeutic interventions for the model. We further recommend that ongoing development and research be conducted to monitor referral trends, staff utilisation, service provision, and clinical outcomes where this model of NP service is incorporated into existing health service systems.

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ADVANCED PRACTICE NURSES IN MELBOURNE'S HOSPITALS: CLINICAL COORDINATORS IN A RAPID ASSESSMENT MEDICAL UNIT

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ABSTRACT

Maintaining optimum health and functioning of ageing populations is an ongoing challenge for acute care facilities worldwide. As populations age, the risk of illness and potential debility increases with the increased rate of comorbidity, multipharmacy and sensory and muscle bulk loss that accompany old age. With these factors comes the potential for increased hospital admission rate, prolonged immobility, reduced function and increasing length of stay (NHMRC 2000). To address these issues, a hospital in Melbourne has developed a Rapid Assessment Medical Unit (RAMU) which provides comprehensive multidisciplinary assessment and commences discharge planning for all medical patients within 48 hours of admission. Coordinating this function is a Clinical Coordinator (CC), who is an advanced practice nurse (APN): a particular feature of the model. Parsons and McMurty (1997) argue that APNs in this role significantly enhance effective utilisation of health services through comprehensive assessment and contextualisation of patient health issues. The result is a streamlining of care, effective and efficient use of resources with an emphasis on discharge planning and community support.

INTRODUCTION

Modern health services are being confronted with enormous challenges. Social demographics show the Australian population is ageing with resultant complex social, functional and health needs. In 2001 12% of the Australian population was aged 65 or older and by 2021 this will increase to 18% (NHMRC 2000). As populations age so does the incidence of multipharmacy, comorbidity, sensory impairment, and muscle bulk loss which combine to increase the risk of acute illness, immobility, functional decline and frequent, extended hospital admissions (NHMRC 2000). The cost to the individual in health, function and quality of life can be enormous. The cost in dollars to a fiscally challenged health care system can be equally as damaging.

Between May 1999 and April 2000, 78.7% of all medical patients admitted to the study site in Melbourne, were aged 65 years or above. The average length of stay for medical patients in this group was eight days, which did not compare well with the Victorian state average of 5.8 days for the same period. Similarly 36.6% of medical patients were readmitted to the study site within three months of discharge.

Patient care delivery was costly for the hospital (at approximately \$AUD500 per bed/day) with relatively long inpatient stays and with one-third of medical patients readmitting within three months of discharge. There were also potential lifestyle consequences for the patient.

On retrospective analysis of patient records, several issues became apparent. There was a lack of timely comprehensive assessment, consistent care planning, community consultation and discharge planning; all impacting on the above with consequences for both patient and hospital.

To address these issues the hospital developed a revolutionary model of care for medical patients. The new unit opened in April 2000 and is called the Rapid Assessment Medical Unit (RAMU). All medical patients admitted are assessed in RAMU where, within 48 hours, medical, nursing, functional, cognitive and social assessments are conducted. This process is coordinated and documented by the Clinical Coordinator (CC), an advanced practice nurse (APN). The CC coordinates a comprehensive, multidisciplinary team approach whereby patient issues are contextualised in terms of their effect on patient safety, functioning and well being. Discharge planning is immediately commenced with all issues communicated to team members. The patient and community carers are consulted, educated and informed of all facets of the care plan.

This article reviews the literature to examine the advanced practice nurse role, the value of APNs and the benefits APNs have with patients with complex needs. In particular this article will be focusing on APNs in acute care settings caring for medical patients.

LITERATURE REVIEW

The Australian population is ageing with the proportion of people aged 65 years or more increasing from 12% in 2001 to 18% by 2021 (NHMRC 2000). Nearly 80% of medical patients admitted to the study site in 2001 were 65 years or older therefore the importance of effective and accurate assessment, contextualisation of their illness and timely discharge planning is obvious.

Historically, patient assessment and therefore care delivery and planning have been illness focused which has failed to acknowledge the impact of acute illness on the older patient's function and safety in the community. The RAMU, however, promotes a comprehensive model of patient assessment, planning and care provision. This process identifies acute, chronic and potential functional and safety issues which all impact on the patient's need for post discharge support and maintenance of independence (Abraham et al 1999; Johnson et al 1995; Metz 1999; Slaughter et al 2000).

Facilitating the implementation of RAMU's model of comprehensive patient assessment and planning is the CC, an APN. The APN role originated in the UK and USA and requires nurses with relevant experience and qualifications to practise at a highly skilled, autonomous and independent level (Sidani and Irvine 1999). Internationally, APNs are highly valued members of healthcare teams whose practice is informed by skillful and comprehensive assessments and coordination of multidisciplinary service provision that is tailored to meet the needs of patients and community carers (Simpson 1997).

The CC's ability to assess all facets of the older patient's function is imperative in planning appropriately. As the NHMRC (2000) suggests this group is jeopardised

by multipharmacy, sensory and muscle bulk loss, comorbidity and chronic illness which, when accompanied by acute illness and prolonged immobility, increases the risk of functional decline and therefore reliance on expensive resource intensive acute health care services and overstretched community home supports.

In recognition of these issues, CCs, in conjunction with patients, primary carers and a multidisciplinary team, develop a care plan that encompasses illness, cognitive and functional issues to maintain independence and life quality for the patient whilst in hospital and in the community.

CCs are arguably unique in this role in their ability to contextualise the impact of illness for the patient. CCs assess the meaning of illness for each patient and assess the cognitive, functional, and social impacts for the patient of their illness. This ability to '...understand what illness means to the patient, what it interrupts, and what recovery means' (Benner 1984, p.75) informs the development and coordination of the individualised management plan.

On RAMU the CC's role encompasses four core functions: assessment; planning, facilitation of information exchange; and, education. These functions were identified by Donagrandi and Eddy (2000), Peterson-Sinclair (1997) and Simpson (1997) as critical elements of advanced practice. Benner (1984) enhances these suggestions in her description of expert nurses' skilful ability to comprehensively assess the patient and contextualise the illness to create a vision of '...what is possible' (p.35).

The benefits of APN assessment and intervention are potentially widespread with enhanced patient outcomes and satisfaction, reduced length of inpatient stays and resulting in improved access to health care and cost savings for the institution (Anderson et al 1998; Johnson et al 1995; Parsons and McMurty 1997).

By comprehensively assessing medical patients, RAMUs CCs identify those who are at risk of functional decline as a result of illness and hospital admission, a function Naylor et al (2000) and Schifalacqua et al (2000) suggest APNs are highly effective in performing.

In identifying patients at risk of functional decline, mortality, hospital readmission rate and the need for people to enter aged care facilities remains unaltered however Nicholaus et al (1999) and Schifalacqua et al (2000) argue the interventions initiated by APNs reduce the length of initial and subsequent admissions, improves and maintains functional status and delays entry to residential aged care facilities.

The introduction of the CC role in RAMU has been pivotal in addressing many of the inefficiencies of traditional models of patient treatment and planning at this hospital. There is an increasing recognition and

appreciation of expert nursing practice especially in the assessment and planning phases of the medical patient's stay: phases that are emphasised in RAMU. The CC's skill and ability to contextualise the patient's illness and assess the impact of hospitalisation on the patient's function and independence has promoted an approach to treatment that has moved away from an illness focused, reactive model towards a model that is comprehensive, proactive, problem orientated and patient focused; in essence CCs encourage holism through collaboration and multidisciplinary teamwork. Although the introduction of the CC role has been beneficial and effective in many areas, there are still improvements to be made which will be discussed further.

DISCUSSION

At the hospital in Melbourne, 79.7% of all medical patients admitted were aged 65 years or more. Therefore, the majority of medical patients are at risk of confronting issues associated with ageing and potential functional decline. In the 12 months prior to the introduction of RAMU, April 1999 to March 2000, the average length of stay for this group of people was eight days, significantly longer than the Victorian state average of 5.8 days. Care and discharge planning was random and this process was at best ad hoc and no coordination of patient management existed. With an ageing Australian population who are increasingly at risk, these issues were likely to perpetuate thus resulting in unnecessarily extended hospital stays potentiating functional decline and lifestyle consequences for patients and significant resource and financial stains for the hospital and community providers.

In April 2000 the hospital's RAMU opened which aimed to address these issues. The aims of the RAMU are to:

1. Promote expert medical, nursing and allied health assessments within 24 hours of admission;
2. Develop a patient focused management plan identifying all patient issues, interventions, discharge criteria and an estimated discharge date within 48 hours of admission to hospital;
3. Streamline previous inefficiencies encountered in providing acute patient care; and,
4. Improve public access to health care at the hospital.

For this model to succeed, however, there had to be one health care professional to coordinate the process. Hence the CC role was developed.

The CC role is an APN role which has evolved since the inception of RAMU. Initially the CC role was to be primarily an independent, autonomous role that provided clinical expertise with extended responsibilities for example ordering radiological and pathological tests, catheterisation, cannulations and arterial blood sampling.

However, medical patient demographics presented an unforeseen challenge. It quickly became apparent that the majority of the patient group were older people who were functionally jeopardised requiring support from spouses, family and friends and government to remain independent and safe in the community.

Jacobzone (2000) identifies this issue and suggests that illness is not the primary concern for older people and modern health care; it is the need for functional support to maintain independence and safety. This realisation reinforced the importance of effective risk assessment and discharge planning. With adequate expert nursing and medical staff on RAMU to perform technical aspects of patient care, CCs, whilst maintaining autonomy and independent practice, adapted their role to address the need for a skilled professional to comprehensively assess patients and coordinate a plan that addressed the needs of the patient whilst in hospital and in the community.

This adaptation of role is consistent with Hook et al (2000), Naylor et al (2000) and, Schifalacqua et al's (2000) suggestions that APNs are highly effective in identifying people at risk of functional decline as a result of illness, immobility and hospital admission.

This suggestion was evidenced at this hospital site with CCs identifying 30% of medical patients requiring geriatrician and aged care consultations. In turn, the increased demand for aged care services has resulted in service adaptation with the opening of the Acute Care of the Elderly (ACE) unit. The ACE unit is geographically and ideologically designed to enhance and maintain functional status of elderly people at risk of decline. In turn independent and safe function will be maintained for patients utilising community service providers, the demand for residential care will be reduced and the cost of extended hospital admissions will be reduced.

The CC role has, therefore, significantly contributed to patient care and practice reform at the study site in many ways:

1. All medical patients now benefit from a comprehensive assessment where all facets of their health and functioning are assessed;
2. All issues are incorporated into a concise care plan which identifies patient problems, interventions, desired outcomes, allied health referrals and an estimated discharge date;
3. Allied health referrals are made within 24 hours of patient admission thereby enhancing effectiveness of allied health assessment and early input;
4. All patients and primary carers are now consulted and educated in care plan development;
5. Increased hospital-community communication occurs;
6. There is increased patient and carer satisfaction as indicated in satisfaction surveys; and,

7. The effectiveness of the CC's ability to identify patients at risk of functional decline has contributed to the recognition of the need for acute care services for the elderly.

However, there is still need for improvement. The average length of stay has not significantly decreased. In the 12-month period preceding RAMU the average length of stay for medical patients was eight days. This fell by 0.3 days to 7.7 days in the 12-month period after RAMU opened.

Similarly, unplanned readmission within a three-month period is yet to indicate significant improvement. In May/June/July 1999 prior to RAMU 17% of medical patients experienced an unplanned readmission within three months of discharge. For the same period in 2000, this fell to 13% but in 2001 for the same period this rose to 15%. The reasons for lack of improvement in these indicators are complex and multifactorial.

The lack of apparent improvement since the opening of RAMU and the commencement of the CCs may indicate that there are inaccuracies with prediction of events that impact on hospital stay, it may also indicate that the planning process requires refinement. As a result, CCs are looking to further modify and adapt their role. Thus far CC practice has been confined to the RAMU. Therefore, as patients leave this area and transfer to medical wards, contact is lost restricting CC's ability to monitor patients, evaluate and modify interventions. This is under review. CC's ability to enhance patient and organisational outcomes will be enhanced with increased opportunity to monitor patient progress, evaluate the care plan and facilitate the medical team towards client goals from admission to discharge.

The CC performs several key functions in the assessment and care planning phases of the medical patient's episode. CCs are responsible for risk screening and assessing all medical patients for cognitive, functional and safety perspectives which necessitate CCs gathering collateral information from the patient and his/her primary community carer. CCs work closely with the physician and attend physician ward rounds during which time all issues are discussed with the patient and a multidisciplinary care plan is developed which identifies assessment information, patient issues, interventions and outcomes to be achieved by an estimated discharge date. During this process the CC has identified the need for allied health staff and has referred appropriately. This plan is formulated, documented and communicated to the patient, primary carer and the relevant team members within 48 hours before the patient is transferred to medical wards.

RAMU's CCs skill in identifying elders at risk resulted in 30% of all medical admissions being referred to the Aged Care Consultation Service. In response to the demand for aged care services, 2001 saw the opening of an Acute Care of the Elderly ward: a unit geographically

located and ideologically focused to address the needs of elderly patients at risk of loss of function. The effectiveness of the CCs as APNs in accurately assessing and screening medical patients assists in the recognition of the need for such services which potentially enhances satisfaction and life quality for elderly patients in their maintenance of independence.

CONCLUSION

The need for improved access to medical expertise and treatment at a Melbourne hospital prompted the opening of the RAMU in April 2000. To coordinate treatment and services, APNs were employed and are known as Clinical Coordinators. The latter are highly skilled and appropriately qualified and experienced nurses who practise independently and collegially with all members of the multi disciplinary team. They focus on the need to contextualise the meaning illness has for each patient and therefore to plan appropriately. Since their inception in April 2000, CCs have contributed positively to patient service processes, service provision and practice reform. However, CCs are re-evaluating their practices and have identified areas of improvement. The next year will continue to provide challenges and see further adaptations to the role which will further enhance patient and organisational outcomes.

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